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Dr WILLIAM MAC CORMAC ON AMPUTATION OF THE THIGH.

Forster & Cn Dublin

THE

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PART I.

ORIGINAL COMMUNICATIONS.

ART. I.—*Observations on Amputation of the Thigh and on the Merits of that Operation as Compared with Excision of the Knee.* By WILLIAM MAC CORMAC, M.A., M.D., F.R.C.S.I.; Member of the Senate of the Queen's University; Fellow of the Royal Medical and Chirurgical Society of London; Member of the Surgical Society of Ireland; of the Ulster Medical Society; and one of the Surgeons to the Belfast General Hospital.

FEW necessities, in many respects, are more painful than when amputation of the upper or lower extremity is required for disease of one of the articulations, whether it be of the thigh for disease of the knee, or of the arm for disease of the elbow. Sir William Fergusson, in his *Lectures on the Progress of Surgery*, styles amputation at once one of the meanest and greatest of operations. It is certainly, in the case of disease, a confession of failure—a rude, yet ready, and oftentimes effectual method of disposing of a difficulty we feel unable otherwise to surmount. Yet, as into the nature of many diseases we are confessedly unable to penetrate, as many are equally beyond the reach of our curative resources, and as injuries received, whether in war or in peace, seem only to increase

in severity as civilization is said to advance, surely under circumstances such as these amputation has been rightfully called one of the greatest of surgical operations.

Most fortunately, in the case of disease of the elbow, the beautiful mechanism of the hand and forearm is now but rarely sacrificed, excision of this joint having proved eminently successful. When it was proposed to save the foot and lower limb by a similar operation practised upon the knee when attacked by disease, it is not surprising that the proposal should have been joyfully hailed, and in many instances extensively and enthusiastically adopted. Now, as chronic disease is found in the knee perhaps more frequently than in any other joint in the body, and as the results of treatment, especially in hospital cases, are but too often the reverse of satisfactory, it is the more necessary that every alleged improvement should receive our most careful consideration.

Since the revival of excision of the knee by Sir William Fergusson in 1850, the operation has been practised a large number of times, and although the materials are perhaps now available wherewith to form a tolerably correct estimate of its value, there is almost no established surgical procedure regarding which such wide differences of opinion exist, or about which controversy has more hotly raged.

No one will be disposed to deny that to preserve a strong and useful limb, firmly anchylosed at the joint, at an equal risk to life, is in every respect more praiseworthy and more surgical than to lop it off with the knife, and that where its preservation is practicable, to amputate would be an opprobrium of surgery. Nevertheless, as I conceive it to be our paramount duty to endeavour to preserve human life as well as limb, it becomes obligatory upon the surgeon to inquire not only into the abstract merits of every novel procedure, but very carefully into the effects it may have as to safety or otherwise. To this consideration I think every other should be forced to yield, and it is in the hope of adding something, however trifling, to the common fund of information, that I have ventured to place before the readers of this journal some observations on the question of amputation of the thigh, more especially in reference to excision of the knee-joint.

The idea was partly suggested by the history of a case of disease of the knee in a young girl, whose limb I was extremely unwilling to sacrifice. She was a pretty, delicate creature, only eighteen years of age, very thin, and very anxious-looking. She was first

admitted to hospital, under my care, with simple synovitis of the right knee, in March, 1866, but had for several years been complaining from time to time of pain and uneasiness in the joint. After a month's treatment she was discharged relieved, only to be re-admitted a month afterwards. By appropriate means, and the opening of an abscess over the inner tuberosity of the tibia, she was again enabled to return home somewhat improved in health. At the end of September she sought admission a third time in much worse condition than before. A sinus leading to diseased bone existed where the abscess had been opened, and another had formed in the popliteal space. After trying various means without avail, an exploratory incision, cutting down upon the inner tuberosity of the tibia, was made, and a large quantity of carious bone gouged out. I hoped that the disease was subarticular caries, confined to this position, and the result for a time justified the expectation. The pain, which previously had been almost excruciating and incessant, wearing the poor girl down, and causing her to implore relief, was completely removed, and she recovered so far as to return to her employment, and to obtain complete remission of all suffering for two or three months. Half a year later, on April 30, 1867, she came again to hospital. For the last few months the disease had been progressing rapidly, and she was suffering great pain and spending sleepless nights. The disease, which formerly appeared confined to the upper extremity of the tibia, now evidently implicated the lower end of the femur, which had become inflamed, and was covered with thickened periosteum for three inches up. The sinuses were unhealed and discharging ichorous pus. There was very little effusion into the joint, and not much into the tissues around it. Careful examination of the lungs failed to detect any marked disease, although the respiratory murmur was somewhat roughened. This case would not longer brook delay, and the question was whether to excise the joint or to amputate. The poor girl herself was most anxious that her leg, which was a shapely one, should not be sacrificed, and so I was myself, but I was constrained to adopt the latter mode, as I felt that her shattered constitution and wasted frame would not withstand the drain of such an operation as resection, even if she escaped its more immediate consequences. And here I would enter a protest against allowing the patient himself to decide such momentous questions. It is the business of the surgeon to do so, and he should not shirk his responsibility by trying to shift it to the

shoulders of another, whose state of health and ignorance of the subject, so totally unfit him from arriving at a just conclusion.

On the 3rd May, after consultation with my colleagues, the patient was brought down to the theatre, submitted to the influence of chloroform, and the following operation performed. The point of the femur selected for division was just at the termination of the thickened and inflamed periosteum. An anterior oval flap, extending to the upper margin of the patella, was formed by cutting from without inwards, and including most of the soft parts on the front of the thigh. The flap at its base equalled half the circumference of the limb. A short posterior flap was then made by transfixing the limb. Both flaps having been retracted, a circular sweep of the knife was made at the point where the femur was to be sawn, and the bone carefully divided. The main vessel, and six smaller arteries having been secured, it was found that not an ounce of blood had been lost. Six sutures brought the edges of the wound into accurate and easy apposition. Some strips of moistened lint, secured by a few turns of a bandage, were the only dressing.

On examination of the joint after removal, the disease was ascertained to be more extensive than had been supposed. The soft tissues were infiltrated with gelatinous material, the cartilages of incrustation removed, except a small patch over the external condyle, and on the external articulating surface of the tibia. The periosteum peeled easily off the femur up to one inch of the point of section. The cancellated structure of both tibia and femur was much degenerated and infiltrated with oily matter. Four inches of bone, at least, would have required removal before comparatively healthy surfaces of the femur and tibia could have been reached, and even with that the gouge would have proved needful.

Respecting the after progress of the case, nothing could have been more satisfactory. In twelve days the girl was convalescent, and in my note-book I find that on the 18th May, fifteen days after operation, it is reported that she can bear firm pressure on the face of the stump without wincing, and that she was ordered to go out of doors to breath the open air in the hospital grounds for some hours daily. Her appetite is good. She sleeps well, and has no pain whatever. On June 4th she was able to bear the firmest pressure on the end of the stump without pain. The line of cicatrix is quite behind the bone, and out of reach of any pressure applied to the face of the stump. She was discharged on the 8th June, having been retained in hospital longer than was necessary,

in order to exhibit the stump to the students. She was then reported as being in first-rate condition and in good spirits, having been a little over one month under treatment.

The lithograph illustrating this paper is drawn from a photograph taken upwards of a year after operation. The girl has grown quite fat, enjoys excellent health, and, considering her former position, has made a remarkable recovery. She has been for some time anxious to wear an artificial limb, but the circumstances of her friends render it difficult for her to obtain one. The stump is plump, the end of the bone is covered with a thick, movable cushion, against which the patient suffers to be made, without inconvenience, almost any amount of pressure.

Now, in the case of this girl I tried time after time all the means within my reach calculated to aid nature to restore the diseased joint and impaired constitution to health. At one time I almost believed I had completely succeeded. The disease, however, returned and progressed, and, just before her last admission to hospital, so rapidly, as to show that no further time could be lost without destroying the patient's chances of life. Up till the last moment I was most anxious to have performed resection of the joint, but at the eleventh hour I had to abandon all idea of it. I became convinced, and it was also the unanimous opinion of my colleagues, that the girl would in all probability never survive the operation of excision. That she made a good recovery after her limb was amputated is abundantly clear. The history and termination of this case recal very forcibly the particulars of the last one, in which excision of the knee was performed in the Belfast Hospital. The patient was a well-nourished girl of eighteen. The knee had been the seat of chronic disease for five years. Apparently it was not extensive, and was confined chiefly to the end of the bones. There were no sinuses or collections of matter, and there was no visceral disease. Altogether the case seemed a most favourable one. After the operation, the shock and prostration which ensued, and continued a long time, were frightful. I have seldom seen greater, and in sixteen days she was dead from pyemia. The H-shaped incision was employed, and the transverse wound healed; but I have often seen this healing, in the first instance, of wounds in cases which afterwards turned out unfavourably. I have now performed amputation of the thigh for disease of the knee-joint several times after the manner before described, and have good reason to be satisfied with the results.

The operation is essentially similar in principle to that proposed by Mr. Teale, over which it possesses considerable advantages, without the imperfections which are unavoidable with the rectangular flaps. The profession were much struck with the advantages claimed for Mr. Teale's method of amputation, which was first, I believe, applied to operations on the thigh, and afterwards more extensively employed—and in the August number of this Journal for 1866 Mr. Croly enthusiastically advocates its superiority over other methods.

To me it has always appeared that the inordinate length of bone often necessarily sacrificed in order to fashion the flaps according to the prescribed rule was an objection which, if not insurmountable, counterbalanced, at least to a large extent, the advantages which might otherwise accrue. If any one will map out on a moderately muscular thigh the flaps necessary to amputate by Mr. Teale's directions, the anterior being made to go as far as the upper border of the patella, he will be amazed, if he have not previously made the experiment, to see how far up the limb the bone must be sawn through. Indeed Mr. Teale admitted the force of this objection, and recommended that in a muscular limb the long flap should not be made so extensive, and that in amputations near the knee the flap should be dissected from the front of the leg, over the patella. It is not difficult to imagine several conditions, both of disease and accident, in which these suggestions would prove impracticable. It becomes, therefore, an important question, says Mr. Lister, in Holme's *System of Surgery*, whether the advantages of Mr. Teale's method may not be obtained in some less objectionable manner. Sédillot recommends a single, long anterior oval flap, and a transverse division of the posterior parts, which would involve a division of the bone nearly as high as in the rectangular, and the operation recommended by Mr. Spence is almost precisely similar. The operation I am in the habit of performing has the addition of a shorter posterior flap, which may be made to vary in length according to circumstances, but should not exceed half the length of the anterior one. Mr. Lister is much in favour of this form of amputation, and it seems to combine, with all the advantages, none of the disadvantages, of the method by rectangular flaps. No bone need be unnecessarily sacrificed, and as each inch of the femur adds, when divided higher up towards the trunk, about five per cent. to the rate of mortality, this is a matter of some importance. There is also a relatively smaller cut surface exposed than in Teale's operation. The flaps admit of exact coaptation, and the line of

junction is at the most dependent part, but not underneath the stump, as in Teale's, where it must be subjected to pressure. There seems to be no tendency to protrusion of bone or to conical stump, which, from whatever cause, is not infrequent after amputation of the thigh, while the end of the bone is covered with a thick cushion very different from the thin tender skin which so often covers the end of a stump after the circular operation.

It is hardly necessary to detail the steps of the operation; the anterior flaps should be fashioned by a bold sweep of the knife right down to, or partially through the superficial muscles, which should be then rapidly dissected up. The posterior flap containing the large vessels and nerves is formed by transfixion, and by retracting the flaps, and sweeping the knife around the bone, it can be divided, if necessary, much higher than the base of the flap. Mr. Luke recommends an operation just the converse of the one described, with the important exception that the flaps are equal in length. He first transfixes the posterior flap, and then dissects up the anterior. I am at a loss to see any advantage in this order of proceeding, and it is manifestly undesirable to divide the great vessels in the first incision, besides the extreme likelihood of splitting them or cutting them very obliquely. The after treatment I employ is always of the simplest kind. After the sutures are inserted, a few pieces of lint, wet in carbolic acid lotion, are passed over the face of the stump, and kept moist. I have never found any advantage from the application of the acid, either strong or diluted, to the cut surfaces, but rather the reverse. It is my constant practice to give such nourishing food as the patient can assimilate, from the very first. Of course general hygienic as well as moral influences should be always rigorously attended to.

In the very last case in which I operated, for very severe old-standing disease of the knee, intermediary hemorrhage occurred, the stump filled with blood, required to be opened, and have the clots removed; oozing, however, continued, apparently from the entire surface of the flaps, or *a l'eponge*, and it was not until after iced water had trickled over them for some twenty-four hours that the bleeding was arrested. During this time the unopposed muscles retracted to a large extent, and it required very careful dressing for many days before the edges of the wound were again brought in contact, although the flaps seemed originally most ample. In spite of this untoward accident the patient recovered rapidly, being up and about in sixteen days. I have preserved,

in a photograph, the appearances of the excellent stump which resulted. It is as good, if not better, than the one represented in the plate. I think it is extremely probable that protrusion of the femur would have resulted in this case, had the ordinary circular operation been selected.

I cannot agree with Mr. Lister in thinking that the skin should be dissected from the muscles when forming the posterior flap. It is a tedious and unnecessary complication of an operation, otherwise extremely simple, and capable of being performed with great rapidity. The retraction of the posterior muscles, which this modification is meant to counteract, is a gradual process, and I have never seen it excessive, while, if the anterior flap be sufficiently ample and well formed, this retraction proves of ultimate advantage by drawing the line of cicatrix further back.

On looking over the published accounts and statistical tables of amputations, and the mortality after various operations, one cannot fail to be surprised at the enormous discrepancy between the statements of different authors. Of no operation can this be said with, perhaps, greater force than of amputation of the thigh. We find Mr. Syme alleging the average mortality to be not less than from 50 to 70 per cent., according to the stern evidence of hospital statistics. M. Legouest has collected 2,274 cases from various sources, amongst which there was a mortality per cent. of 84·79. In the French army in the Crimea the mortality was 91·90, in the English it was 65·20, while in the late American war it was 64·43. In civil practice it is, of course, much less, being 41·6 according to Mr. Lane's statistics, and the records of the New York and Pennsylvania hospitals give an estimate, almost equal, of 41·4. With such various amounts, one is inclined to agree with Gross when he states "that the mortality after operations is influenced by so many extraneous and intrinsic influences, that it is extremely difficult, if not impossible, in the existing state of science, to arrive at any satisfactory conclusions respecting it."

No doubt much confusion is attributable to the manner in which statistics are in many instances compiled, no discrimination being made between amputations for disease and injury; no allowance granted for the age and sex of the patient; and, what is of the last importance, no stress laid upon the part of the limb at which the operation has been practised. Now it is well ascertained that amputation performed for disease is vastly less fatal than when necessitated by injury; that amputation is less fatal in women than

in men; that amputation, even of the thigh, is rarely fatal in young children, and that the proximity of the incisions to the trunk has an enormous influence on the death-rate.

Now, the amount of mortality after amputation of the thigh is of especial importance, being an essential consideration when estimating the value of excision of the knee-joint. I think it may be assumed that the relative desirability of, and danger to life in, these two operations are still matters somewhat warmly disputed. For while Sir William Fergusson, Mr. Butcher, Mr. Henry Smith, and the late Mr. Price have contended that the dangers of the operation of excision of the joint are even less than those apt to occur after amputation through the thigh, other distinguished surgeons may be cited who entertain very different opinions. If I interpret them aright, Mr. Syme, Mr. Coote, Mr. Timothy Holmes, Dr. Hodges, of Boston, and others, esteem excision as not only more dangerous to life, but as presenting advantages which must often be considered highly problematical, or attainable only at immense cost. To endeavour to place the facts in a manner which may tend in any way to determine this vexed question cannot be regarded as without importance.

In the first place we should be mindful to institute a fair comparison, and not to contrast, for example, excisions of the knee for disease, as they almost exclusively are, with amputation of the thigh, whether performed for disease or injury. Amputation for injury should be compared with excision for injury, and amputation for chronic disease, and for disease of the knee-joint in particular, is the only fit subject with which to contrast excision of that articulation when diseased.

To form a just conclusion respecting the mortality after the excision of the knee for injury, there is hardly sufficient material. Eleven cases are recorded in circular No. 6, by the Surgeon-General of the United States army, where resection had been performed for gunshot wounds. Of these nine died, and as of one of the recoveries it is stated in the circular that "the success claimed is so extraordinary as to suggest some doubts of its authenticity," we may fairly exclude it from our consideration. Indeed the published account of this case bears internal evidence of the justice of the Surgeon-General's remark. In a paper recently published in the *Archives Générales de Médecine*, M. Spillmann has collected particulars of twenty-one cases where resection of the knee has been resorted to in military surgery, and nineteen times a fatal result is said to have

ensued. This does not include the Alumbaugh case in 1858, when a native soldier had his right knee excised, and the left thigh amputated at the same time. As might be expected, he never rallied from the shock.

This is, without doubt, a frightful amount of mortality, and the conclusion M. Spillmann arrives at few will be disposed to dispute. He says, that "Toutes les illusions doivent tomber devant une pareille expérience. La résection ne peut s'appliquer à la chirurgie d'armée, si ce n'est dans des conditions très exceptionnelles." Military surgery, however, affords no fair criterion of the fatality of the operation in itself. The exigencies of the field of battle and of the camp, afford but little opportunity for that careful after-treatment and repose so necessary to ensure success; and the injuries inflicted by modern projectiles are so severe and extensive, especially of the bones, that it is difficult to ascertain the actual extent of the damage previous to operation. In civil practice, when the operation has proved necessary for injury, the results, so far, have been very encouraging. M. Spillmann has given details of thirteen cases with only three deaths. One of the fatal cases, that of Mr. Hutchinson, being from tetanus—the patient at the time was progressing favourably.

In some of the instances referred to, the majority of which were young subjects, the operation was performed at short periods after the accident, when inflammation had set in, and under circumstances that would have rendered amputation probably, if not certainly, fatal. Although the cases prove few in number, the results are striking, and should certainly encourage us to attempt the preservation of limbs by resection of the knee, which by gunshot or other injuries of the articulation, would otherwise have been certainly condemned to amputation.

The question, however, of the desirability of excision of the knee for disease of the joint, is of much greater importance, owing to the comparative frequency with which it has been lately practised. I do not mean to advert to this method of treatment as applied to cases of deformity of the lower limb, the consequence of previous disease, further than to say, that I think our experience, although somewhat limited, distinctly forbids our performing the operation as one of expediency in persons in health. Dr. Hodges tabulates nineteen cases, of which eight died, the fatal termination being, in each case, more or less directly due to the operation itself. I have to thank Mr. Bryant for informing me of a case in which he recently

removed a wedge of bone for synostosis of the articulation at a right angle. Death took place from pyemia. Twenty cases, and nine deaths, only affords one more example of the fatality which seems invariably to attend *operations de complaisance.*

Mr. Butcher, an ardent advocate of excision, quotes in his work on "Operative and Conservative Surgery" some very limited tables of amputations of the thigh, namely, 19 cases of injury, and 34 of disease, from Mr. Erichsen, with a mortality, respectively, of 58 and 20·5 per cent.; and from Malgaigne's statistics of the Parisian hospitals, 46 cases of injury and 143 of disease, the mortality per cent. being in the first 75, and in the latter, 60 per cent. From these statistics he draws the following conclusions, that "these tables, when contrasted with my second upon excision of the joint, set at rest for ever the question of the comparative danger of the two operations. In these we have forcibly demonstrated that *the danger of excision is considerably less than that attending amputation of the thigh.*" The italics are Mr. Butcher's; who further adds, that "the wound necessary for the removal of the diseased bones is less extensive than that attending amputation of the thigh, whether performed by the circular or the flap operation." It is a matter of small consequence, except so far as it affects the life of the patient, and the results of the operation, which wound is the larger. To me, however, it would appear that the extent of wounded surface exposed during excision must be fully as large, if not larger, than when a limb of equal size is amputated in the lower third. Regarding Mr. Butcher's first assertion, that the question of the comparative danger of the two operations is "set at rest for ever," I must, with every respect for that eminent surgeon's experience, entertain a different opinion. The conclusion is based on only 31 cases, of which it appears that 5 died. The number is far too small from which to make so sweeping a statement. Besides, to show how readily error may inadvertently creep, even into the most carefully prepared statistics, I may mention that in one of the cases, that of the late Dr. Stewart, of the Belfast Hospital, which is quoted in the table as "encouraging," a fatal result ensued in a few weeks. This would give a mortality of 19·35 in the 31 excisions, or only 1 per cent. less than the mortality of amputation of the thigh for disease, as given by Mr. Erichsen. This is rather too small a margin. I do not compare this result with Malgaigne's statistics, since excision of the knee is an operation, to a large extent repudiated by French surgeons, many of whom have

denounced it in strong language, and I am unaware of any statistics of excision as practised in Parisian hospitals. Mr. Butcher gives two other tables; one comprising operations of excisions from 1762 to 1849, 31 in number, with 17 deaths; his last table contains 51 cases and 10 deaths, being down to December, 1856. Of these, however, a good many are simply recorded as "recovering," so that for statistical purposes they are not of much value, and to the first category of cases Mr. Butcher deprecates any allusion. It is assumed, and perhaps correctly, that imperfections in the methods of selection, of operation, and of after-treatment, were the causes of the excessive mortality in the earlier history of the operation. I think we may, with justice, set against these objections the certain fact that a considerable number of patients who have had their knees excised in recent times, have died, and have had nothing more said about them. In all then, we have, in Mr. Butcher's work, a total of 113 cases, with 33 deaths, from one cause or other, a mortality of 29·20 per cent. One or two cases in the first table were for injury, but all the rest were for disease.

Since Mr. Butcher wrote, tables, much more ample and satisfactory, have been compiled, and the means of arriving at a more correct estimate, though still, perhaps, inadequate, are forthcoming.

Perhaps the most complete have been those of Dr. Oscar Heyfelder, of St. Petersburg, and Dr. Richard Hodges, of Boston, published in 1861. The former writer gives the aggregate results of 2,241 cases of excision of bones and joints. The number given of the knee is 213, with 64 deaths and 129 recoveries, being a mortality of 30·04 per cent. Dr. Hodges' monograph is both able and interesting, and he deals with the entire question of excision of joints in a truly scientific spirit. He gives, amongst other tables, one of all the excisions undertaken since 1850 for chronic disease of the knee alone. He acknowledges his indebtedness to Mr. Butcher for 65, and to Heyfelder for 35 of the cases, which amount to 208 in number. Of the whole number, 106 recovered, 60 proved fatal, and 42 patients underwent subsequent amputation. This gives a mortality of 28·84 per cent., chiefly from pyemia and exhaustion. These last figures probably give a tolerably fair and exact estimate of the fatality attending excision of the knee for disease, with all the advantages which modern skill and experience have suggested, and these consist in little else than enforcing rest by suitable means, and interfering as little as possible with the wounded limb. We have, of course, to take account of

those cases which underwent amputation subsequently, implying a failure of the original operation, and which amount in the table to more than 20 per cent. of the cases.

Excluding the earlier cases, up to 1850, recorded in the tables of the late Mr. Price, out of which more than half died, there appear in that surgeon's interesting monograph, some 240 cases of excision performed by British surgeons for disease and deformity, and 53 additional ones are mentioned by Mr. H. Smith, in a note, with a total, when taken together, of 67 deaths, or 22·86 per cent. In 44, however, amputation was subsequently performed. Mr. Price has also given a table of 15 cases operated on by Dr. Heusser, of Zurich; of these 8 recovered and 6 died from the effects of the operation, while one died after amputation. With regard to some more recent cases I have been able to collect from different sources, I find that in King's College Hospital Mr. Smith mentions there have been 53 operations up to 1865, with the considerable mortality of 17, or upwards of 32 per cent. In the Glasgow Infirmary there appear to have been 16 cases, of which 7 died from the operation, and 2 more after amputation, which had to be performed in three instances. Dr. P. H. Watson has recently published an interesting account of 12 cases in which he had himself occasion to excise the knee, six of them proving fatal. In the Belfast General Hospital the operation has only been performed six times; in five instances a fatal result ensued, while one recovered after amputation. In the London Hospital Mr. Curling informs me the operation is not much in vogue. During the last four years resection of the knee has been only twice performed—one case recovered and one died. In Guy's, Mr. Bryant writes to me to say that, so far as he can learn, excision of the knee for disease has only been three times performed. All three failed as cases of excision, and amputation was subsequently practised—one of the patients dying.

Through the courtesy of Mr. Holmes I possess the particulars of seventeen cases of excision performed in St. George's Hospital since 1863. One of them is still under treatment, and is likely, Mr. Holmes states, to prove fatal. It may therefore be left to one side. Of the remainder four died, and one was subjected to re-excision, but with what result is not stated. Twelve of the patients were under fifteen years of age, the youngest being only four—a circumstance favourable to successful excision. In the Royal Infirmary of Bristol there have been since 1860 six cases of excision. All of them recovered, but in three instances amputation proved

necessary. Mr. Crosby Leonard, through whose kindness I obtained the information, does not mention what amount of usefulness was attained by the limb in the three successful cases.

In St. Thomas's Hospital the practice of Mr. Le Gros Clark has been attended with striking success. He has operated a dozen times. In only one instance, that of a strumous child, was the operation primarily fatal. The patient never rallied afterwards. In a young woman of eighteen, excision proved successful in the first instance, as firm osseous union took place between the opposed ends of the tibia and femur. The patient went to the sea-side, but returned to the hospital with recurrent caries, and rapidly declining health, compelling Mr. Clark to amputate fifteen months after the first operation. In the letter this surgeon has favoured me with, he states, that with these two exceptions, all his cases have recovered, some with excellent limbs and scarcely perceptible lameness, others with firm but less sightly limbs. The period of recovery has varied considerably. He further adds:—"I think there is no doubt that early interference by operation favours success, but I am also satisfied that protracted rest will cure many cases where excision might get the credit if performed."

Adding these cases together, which have been collected without distinction from such sources as were available to me, we have an aggregate of 126 hospital cases, Dr. Watson's being, with one exception, operated on either in Chalmers's Hospital or the Royal Infirmary of Edinburgh, and of these 41 died from the operation, or 32·45 per cent., while 12 of the limbs were afterwards amputated, and of these 4 died. It should be mentioned that one of Dr. Watson's excisions was for injury.

In striking contrast to this high rate of mortality, is the extraordinary success attending the practice of some surgeons. Mr. Butcher has been successful in each of his six cases. Mr. Jones, of Jersey, had at one time nineteen excisions of the knee, with only one death; and although Mr. Humphrey, of Cambridge, has had but six deaths in thirty-two cases, he has found it necessary to amputate on eight occasions.

The determination of the amount of fatality after amputation is fortunately not surrounded by difficulties at all so great as those found in respect of excision. Extensive tables, bearing on the question, have been published from time to time, chiefly extracted from hospital records, and although they vary in some instances immensely, an analysis, carefully made, will detect the causes in

some local circumstances, or in the manner they have been compiled. Mr. Lane's statistics, published in Cooper's Dictionary, gives 641 cases of injuries requiring amputation, with a mortality of 57 per cent. In the Glasgow Infirmary, and in the Belfast General Hospital, it has been the same, amounting to 50 per cent.; whilst, as previously cited, it varies in war, from 64 in the American army, to 91·90 in the French during the Eastern campaign.

It is, however, with the mortality in operations performed for disease that we have now to deal. Mr. Lane's tables give 705 cases, with a percentage of 27·23 deaths. In some statistics published a few years back in the *Medical Times and Gazette*, the amputations of the thigh and leg, in the London and provincial hospitals, during a period of three years, are tabulated. Of the former 303 cases are recorded in which the operation had been practised for disease, with 71 deaths, or 23·40 per cent. I have searched the register of our own hospital carefully for many years past, and find the fatality after amputation of the thigh, for disease generally, amounts to 32·35 per cent.

We know, however, that, irrespective of injury, disease of the knee-joint forms by far the most frequent cause of amputation of the thigh, and it becomes important to ascertain the percentage of death after this operation as correctly as possible. Mr. Bryant has pointed out, in a paper in the *Medico-Chirurgical Transactions*, on "The Causes of Death after Amputation," that amputations of the thigh for other diseases than that of the knee, such as, for example, different kinds of tumour, necrosis, elephantiasis, and deformities, are very fatal. In his paper 24 such cases, which are, to a certain extent, mere operations of expediency, are tabulated, with 11 deaths, or 45 per cent. In our own hospital 17 similar cases have resulted in death 13 times, an unusually large mortality.

On the other hand, Mr. Bryant gives 89 cases in which amputation was performed for chronic disease of the knee in Guy's Hospital, 13 only, or 14·60 per cent., proving fatal. In the Belfast Hospital amputation has been performed for the same reason fifty-four times, and 10 cases ended fatally, being a mortality of 18·51 per cent.

From the Bristol Royal Infirmary I have obtained a record of 28 cases of amputation for disease of the knee, 5 of which terminated fatally. In 2 of the fatal cases the patients were respectively sixty and seventy-five years old, and 3 of the deaths were caused by phthisis, soon after the operation. From St. George's Hospital Mr. Holmes has furnished me with a list of 20 amputations for

diseased knee-joint, which have occurred since 1865. Five cases, all adult patients, proved fatal. Mr. Holmes has also published an account of 35 cases in the *Medical Times and Gazette* for 1861, which underwent amputation for a similar cause prior to that date. Of this number 5 were fatal. In the same Journal for 1860 a statistical report is given of the operations in 16 provincial hospitals during 1859. Amongst them are 35 cases of amputation for chronic disease of the knee, with only 2 deaths. If these be added together we have a total of 261 cases of amputation of the thigh for chronic disease of the knee-joint. Of these 40 terminated in death, being a mortality of 15·32 per cent. But supposing these last 35 cases be not included in the computation, as affording an unusually high average, we have still 226 cases of this amputation with 38 deaths, or 16·81 per cent. This, it must be conceded, forms a striking contrast to the death rate in the 126 cases of excision, collected together in a precisely parallel manner, which amounts, as before stated, to 32·45 per cent.

No one will, I presume, be disposed to deny the importance of trustworthy statistics. If confidence can be placed in the manner in which they have been compiled, and in the sources whence they are derived, they must prove of great value, more especially if they be not mere numbers without knowledge; and nothing is, as I conceive, to be compared in this respect, for the purpose of procuring reliable returns, with the publicly-kept register of a general hospital.

As has been previously insisted upon, it is with amputation of the thigh for chronic disease of the knee-joint that excision can alone be correctly compared. It must be remembered, too, that amputation has to be performed on all sorts of cases, however desperate, in order to afford the patient a chance of life, whilst excision is practised, or should only be practised, on well-selected cases—cases, in short, which, if submitted to amputation, would almost certainly prove successful. Indeed, when the necessity for amputation becomes at all urgent, excision is usually out of the question, and the knowledge of this fact is, perchance, calculated to induce surgeons to excise joints which might otherwise have been restored to health by less radical measures. Again, in the statistics of amputation it may safely be assumed that the results of all cases, successful as well as unsuccessful, are recorded; whereas, in respect of a comparatively novel surgical method like excision, it may be quite as certainly concluded that a greater proportionate number of unsuccessful results have never been made public.

The inferences I should feel disposed to draw from the foregoing considerations are, that it would appear, firstly, that the death-rate after excision of the knee is at least twice as great as that after amputation of the thigh, both being had recourse to on account of disease of the articulation, and this does not take into account the frequent failures of the operation, entailing subsequent amputation, and occasionally death. Secondly, that the experience we possess, although still very limited, is distinctly in favour of resection of the joint for severe injury in civil practice, and that amputation, under these circumstances, formerly the invariable rule, may often prove unnecessary. Thirdly, that in military practice there seem to be no grounds for entertaining a hope of the successful performance of excision of the joint for gunshot wounds.

I do not wish to be understood to deprecate the operation of excision of the knee in eligible cases, as I consider it a surgical achievement of the first magnitude; and in some instances which have turned out successfully, the admirable result obtained, surpassing as it does any which may be attained by amputation, compensates for the increased risk, and prolonged and anxious after-treatment required. What I do object to, however, is the apparent desire evinced by some surgeons to shut their eyes to everything unfavourable to excision, while they as persistently ignore everything to the advantage of amputation. It is always in the interest of scientific truth that facts should be clearly and undisguisedly stated. I think the conclusion irresistible that the operation of excision of the knee is both more severe and more fatal than amputation; and that the prolonged after-treatment, extending over months, as compared with weeks in the case of amputation, exposes the patient, of necessity, to a greater number of the accidental risks incident to all operations. Amongst other considerations it should not be altogether forgotten that ordinary skill suffices for the after-management of a case of amputation, whereas difficulties, causing much anxiety and entailing the exercise of no ordinary care, are of frequent occurrence when excision has been performed. This objection is of small weight as applied to hospital cases, but it must have a certain influence upon the general introduction of the operation under circumstances where all the advantages of trained nurses, skilled assistants, and patient personal superintendence on the part of the surgeon himself are not so readily available.

Since writing these remarks, I have read with the most unmixed

pleasure and satisfaction Mr. Holmes' recently-published work on the *Surgical Diseases of Children*, in the course of which he devotes a chapter to "excision of the knee." After stating that he entertains so sincere an admiration for the operation as to believe that it will bear the truth to be told about it, Mr. Holmes adds that he believes it to be more fatal than amputation, and that he is aware of no reason why, under any circumstances, it should prove less so, being, in his opinion, a proceeding of at least equal, if not greater, severity. "But even," says this author, "if I thought that excision would always continue to prove more fatal than amputation, I should still practise it, because I think its results, when it succeeds, are so good that we are justified in running some extra risk to secure them."

I was much gratified to find the opinions I have endeavoured to justify in the foregoing paper were almost identical with those of a surgeon who had won for himself so eminent a position by hard and honest work.

I think enough has been now said to prove that excision of the knee is an operation only to be preferred to amputation where the circumstances of the case are very exceptionally favourable, and only after the most mature deliberation. At the same time I entertain the sincere conviction that the excision of joints, both for disease and for injury, is, in suitable cases, a real progress both in the principles and practice of surgery.

ART. II.—*Version in Contracted Pelvis.*[a] By JOHN RINGLAND, A.B., M.B., M.D., T.C.D.; M.R.I.A.; Fellow and Member of the Midwifery Court of Examiners, and formerly Censor of the King and Queen's College of Physicians of Ireland; Professor of Midwifery in the Ledwich School of Medicine; Senior Master of the Coombe Lying-in Hospital, &c., &c.

IT is now many years since the late Sir Fielding Ould suggested the operation of version as a suitable means of terminating a labour wherein a diminution of the conjugate diameter of the brim of the pelvis constituted the cause of delay. Since then Lachapelle, Radford, Sir James Simpson, Cazeaux, and M'Clintock have added the weight of their great experience in support of that recommendation.

[a] Read at a Meeting of the Dublin Obstetrical Society, 20th June, 1868.

The subject is one of such vast importance, and possesses so much of deep interest for the practical obstetrician, that even a single case added to the history of the subject may be esteemed of value. I therefore offer no apology for submitting the details of the following case, which presents features of considerable and practical value; and I have the less hesitation in doing so, as, in a paper submitted by me to this Society during its first session on March 7th, 1839, on "Labour rendered tedious by Anomalous Conditions of the Pelvis," I advocated "delivery by turning, when there is but slight contraction, and yet there does not exist sufficient space for the application of the forceps." I quote from a *résumé* of my paper, published in the 45th No. of the *Dublin Journal of Medical Science* for 1839, page 493.

I must premise here, that I am about to submit merely a continuation of the history of a case already brought under the notice of the profession. Dr. M'Clintock, under whose superintendence, in the Rotundo Lying-in Hospital, the first three of this patient's labours were completed, having in his able paper on "Turning in Cases of Disproportion," read before the London Obstetrical Society, fully detailed the particulars of these three labours, more especially the third, being one of the cases upon which his paper was founded; whilst Dr. Kidd, who had charge of her in the Coombe Lying-in Hospital in her three labours next ensuing, communicated the details thereof to this Society in his very valuable paper, "A Case in which Premature Labour was induced by the Use of Fluid Dilators," read on the 14th January, 1865, and published in the *Dublin Quarterly Journal of Medical Science* for February in that year. A short *résumé* from that paper will not, I conceive, be out of place here, but will rather constitute a suitable introduction to her subsequent history.

F. K. was delivered of her first child, a boy, on December 16th, 1856, under chloroform, by perforator and crotchet. Great difficulty was experienced in the operation, which occupied an hour and a-half, from the head being above the brim, and the conjugate diameter being contracted. She recovered well, but subsequently got an attack of pelvic cellulitis of the right side.

She was delivered of her second child on the 1st of April, 1858, after a labour of forty-two hours, the breech presenting. Chloroform having been administered, a leg was brought down, and a dead male child thereby extracted. The mother recovered well.

Her third child was born on November 12th, 1859, after a

labour of fifty-six hours, the greater part of which was at her own home. Shortly after her admission to the hospital she was placed under the influence of chloroform, and the left leg brought down; immense difficulty was experienced in extracting the arms and head. The child—a large male—was pale and flaccid, but the heart pulsated, and respiration, after a few minutes, was established. The mother and child left the hospital on the ninth day, both well; and it may not be out of place here to add, that the child is still living.

The Rotundo Hospital having been closed at the time of her fourth labour—April, 1862—Dr. M'Clintock sent her for admission to the Coombe Hospital. She had been many hours in labour before she presented herself. When examined the dilatation of the os uteri was found to be complete; but, owing to the narrowness of the conjugate diameter, the head had not entered the pelvis. Dr. Sawyer succeeded in applying Churchill's forceps, but in consequence of the extreme distance of the head, the lock and portion of the handles of the instrument were within the vagina. Under all the circumstances it was deemed expedient not to make further traction with the forceps, delivery by that means appearing to be impracticable. Version was then performed, one leg having been brought down; very great difficulty was experienced in bringing the head through the pelvis. The heart was feebly pulsating at birth, but respiration could not be established. The child was a male. The mother made a good recovery.

Acting on the advice given her prior to her leaving the hospital on this occasion, she presented herself for admission thereto about the termination of the eighth month of the next—her fifth pregnancy—it having been previously determined to induce premature labour. Accordingly, on the 29th of May, 1863, the vaginal douche of Kiwisch, as modified by Dr. Sinclair—who kindly lent his aid on the occasion—was applied for about fifteen minutes. Marked collapse ensued; but although only used the once, labour shortly set in (of a very languid character, however), the first stage not having been completed for five days. The second stage was short, and accomplished without difficulty. The child—a male—presented with the breech, and was born with the heart feebly pulsating, but respiration could not be established. The mother's recovery was very slow.

In her sixth pregnancy labour was again induced. This was effected on the 24th of November, 1864, being the 240th day from

the termination of her last menstruation, by means of "Barnes' Dilators;" frequent labour pains speedily succeeded their employment, which, however, after a time became irregular and feeble. A stimulating enema having produced no beneficial alteration in them, a full opiate was administered at two a.m. on the morning of the 30th, which produced sleep, after which the second stage of labour set in, and she was delivered of a rather large-sized dead male child; the head presented, and its passage through the pelvis was not difficult. The mother made a good recovery, and left the hospital on the ninth day.

For the particulars of her seventh labour I am indebted to the courtesy of Mr. Young, surgeon of the Monaghan County Infirmary, and Dr. Temple, of Monaghan. She was taken in labour in the evening of the 31st December, 1866, but the presentation was not then ascertainable. Mr. Young saw her three or four times between that and early the following morning, when he found the presentation to be the right parietal. At his last visit—about two a.m.—he was anxious to use a blade of the forceps to rectify the position, but could not prevail on her to submit to his judgment, or do anything desired by him; he accordingly—not being in good health at the time—discontinued his attendance, and that of Dr. Temple was procured. Her labour still proceeded slowly, but as the pains increased the head advanced. On the third morning—January 3rd, 1867—she became so worn and exhausted that Dr. Temple determined to perforate, which he effected without much difficulty, the patient having been first brought under the influence of chloroform. Profuse hemorrhage ensued, which was with difficulty controlled. She recovered slowly and gradually, and finally made a perfect recovery.

In her eighth labour, having proceeded to full term, she was admitted into the Coombe Lying-in Hospital at ten p.m. on the 21st April last, the membranes having spontaneously ruptured some time previously; although she had experienced severe pains, the os uteri—which was reached with difficulty—was found at this time to be only sufficiently dilated to admit the point of the finger. Uterine action altogether ceased for fifteen hours after her admission; at the expiration of that time, however, vigorous labour was established, and left parietal presentation ascertained. Dr. Kidd saw her shortly afterwards—namely, at about two o'clock p.m. on April 22nd—and had the advantage of the opinion and advice of

Dr. M'Clintock. As the os uteri was not yet fully dilated, and was somewhat rigid, the patient herself being very irritable and unmanageable, small doses of Antim. Tart., with Tinct. Opii. in Mist. Camph. were ordered at intervals of half an hour. At seven o'clock p.m. I saw her in consultation with Dr. Kidd, when the os uteri was found perfectly soft and dilatable, but not larger than half-a-crown, the head completely above the brim of the pelvis, and not making the least descent into it, even under the influence of the most powerful uterine action. The promontory of the sacrum projected downwards and forwards to a great extent, and the conjugate diameter of the brim was estimated, by mere digital measurement, to be from 3 to $3\frac{1}{4}$ inches, but no alteration appeared to exist in any of the other diameters. The pulse had now gone up to 120; she was very restless, and a copious olive discharge came from the uterus. Delivery by version was now determined on; she was accordingly brought completely under the influence of chloroform, and I experienced but little difficulty in introducing my hand and grasping both feet. Some little exertion was required to deliver the breech, and still more to bring down the arms. The funis continuing to pulsate, we were most anxious to complete the delivery with as little delay as possible, but it required every effort of Dr. Kidd and myself to bring the head through the brim; the transit through the outlet was effected with but slight difficulty, and it was with no little satisfaction we found that the heart was still pulsating, although its action was very feeble. After a few minutes our efforts at resuscitation were attended with success; respiration was established, and, after about an hour's attention, was altogether perfect. The child was a male, of good size, well thriven, and weighed 5 lbs. 15 oz., and left the hospital quite well. The mother was placed on a grain of opium every third hour. She did not suffer from a single bad symptom throughout her convalescence, and was discharged quite well on the tenth day after her delivery.

Whilst my hand was in the pelvis, during the course of the operation, I carefully examined its condition. The promontory of the sacrum projected forwards to a great extent, and when the finger surmounted it, the upper surface of the projection lay nearly at right angles with the concavity of the bone, to the extent of somewhat more than half an inch, and the spinal column thence ascended in its normal course. Moreover, immediately behind the left pubic bone, there existed a bony knot projecting backwards

into the pelvis, with an elevation of about a quarter of an inch. From these facts I am somewhat inclined to believe that a portion at least, if not all, the deformity of the pelvis, is the result of exostosis; and on mentioning these points to my colleague Dr. Kidd, he expressed to me his opinion that the conjugate diameter is somewhat less than when he saw this patient on former occasions; but as he did not note down the measurements, this is merely conjectural.

With the view to a proximate measurement of the deformity, I placed my hand directly across the antero-posterior diameter, the knuckle of the first finger being against the promontory of the sacrum, and that of my little finger against the projection behind the pubes, and I found it impossible to spread my hand completely flat. The measurement of my hand between the points indicated is exactly three inches; and as I was obliged to very slightly contract my hand while in position, I conceive I may fairly specify that of the diameter under observation at somewhat less than three inches.

An analysis of the history of this woman's eight labours gives the following results:—In her first and seventh labours she was delivered by craniotomy, with, of course, the loss of both children; in her fifth and sixth by the induction of premature labour, one child being still born and the other having the heart pulsating at birth, but respiration could not be established; in each of her second and third the breech presentation was converted into a footling; in one of these the child was still-born, and in the other the child was born alive and is still living; whilst in her fourth and eighth she was delivered by version, in the former of which the heart of the child pulsated at birth, but respiration could not be established; and in the latter the child was born and continues alive. Thus, of the four instances wherein delivery was completed by the feet, one of the children was still born; in one the heart pulsated but animation could not be established, and in two the efforts to induce respiration were attended with success; whilst in the other four instances the loss of the children resulted—strong testimony, I maintain, in favour of the operation of turning in other like cases.

However, whilst recommending this proceeding I must not be supposed as either altogether ignoring, or in the smallest degree detracting from the great difficulties and dangers which present themselves during the progress of the operation of version. Every

practitioner who has performed it knows but too well that such may arise in its every stage; and the history of the case I have now submitted proves that it offers no exception to this experience; had I not had the valuable aid of Dr. Kidd, at the close of the operation, to supplement my physical powers, utterly exhausted by my previous exertion, I apprehend that the child would, in all probability, have been lost, the great disproportion between the size of the head of the child and the bony passage, offering obstacles which demanded every effort we could jointly employ to complete the labour within the limited time compatible with the merest possibility of saving the child's life.

It would be impossible here to discuss the many difficulties of this operation; but it may not be uninstructive briefly to detail the particulars of two cases I have met with since the details of the preceding case were written, and which present some interesting features in illustration of the subject.

At about six o'clock on the morning of the 16th of May last, I was requested by Dr. Keiran to see a patient of his who was in labour of her third child. Her two previous labours were not attended with much delay, but the children were premature, and very small. Her present labour commenced at about six o'clock on the preceding evening, and proceeded steadily. The nurse did not deem it necessary to seek for the attendance of Dr. Keiran until 3 a.m., when he was summoned in consequence of the rupture of the membranes; but although the uterine action was very strong from the time of his arrival, no progress whatever was made towards delivery. When I saw her the head was still at the brim of the pelvis, very tightly fixed, the brow presenting, and the face directed to the pubes; the cavity and outlet of the pelvis were sufficiently roomy, but I could not make a satisfactory measurement of the brim, which, however, I subsequently found to be considerably diminished in all its diameters; the uterus was firmly and persistently contracted, and apparently moulded to the figure of the child; her pulse was quick and small, but she was remarkably cheerful. After the administration of a full opiate in some brandy I made several attempts, both with my fingers and with a blade of the forceps, used as a vectis, to rectify the position of the head, but in vain. I then applied Kennedy's short forceps, but failing to bring the ends of the handles within two inches of each other I withdrew them and resorted to a longer instrument—Murphy's long forceps, about 13 inches in length—but no force I felt justified

in using produced the least alteration in the position of the head. I now determined to resort to version, and, the use of chloroform being altogether contra-indicated by the state of the pulse, I administered a second dose—40 drops—of tincture of opium, and, after a brief delay to permit time for the action of the drug, I proceeded to pass my right hand, but experienced great difficulty and delay in doing so, owing to the still powerful action of the uterus, and its completely moulded apposition to the head of the child. By gentle but steady persistence for a lengthened time, I succeeded in overcoming the first obstacle, only, however, to encounter a virtual hour-glass contraction of the uterus tightly ligaturing the neck of the fetus. This stricture was with patience overcome, and my hand passed into the cavity of the body and fundus of the uterus, when after some little delay, owing chiefly to the numbness of my hand from the long pressure it had sustained, and which precluded my feeling whether there existed pulsation in the funis or not, I succeeded in grasping one foot, which, despite the still violent contraction of the uterus, I was enabled to bring down external to the vulva; beyond this, however, all the traction I dared use could not move it, the persistent uterine action precluding the version of the child and the descent of the nates. I now gave her 40 drops more of laudanum in half a glass of brandy and awaited its effect. After a lapse of about an hour, finding that the violent pains had subsided, I again proceeded with the operation; the foot which I had previously brought down had now receded, but was at the brim of the pelvis and in close proximity to the second foot. Both feet being thus within easy reach I grasped them and made traction, steadily and firmly, but without undue force, and I was gratified to find, after a few minutes, that the difficulty was overcome and the nates were descending. Owing to the general diminution in the size of the brim of the pelvis, great delay and difficulty arose in the delivery of the head. The heart of the child—which was a large-sized male—pulsated slightly after birth, but our efforts had not the effect of establishing respiration. I feel persuaded, however, that were it not for the very great obstacles which presented themselves in almost every stage of this case, and the delay consequent thereon, the life of the child might have been spared, to be another triumph to this operation. This lady was put on grain doses of opium every third hour, and she recovered without a bad symptom.

The next case to which I would direct attention is that of

a patient admitted into the Coombe Hospital, on the 16th June inst. She had been in labour for some hours previously, and was sent to the hospital by the midwife under whose care she was, in consequence of excessive hemorrhage. Dr. Kidd and myself having been in the hospital at the time of her admission, saw her immediately afterwards. The case was one of complete placenta previa, the os being soft and dilated to the size of about half-a-crown. Her pulse was so feeble, and her condition so low, that immediate delivery by version was at once decided on. Dr. Kidd had no difficulty in passing his hand and grasping a foot; when, however, the breach had descended so far as the perineum, all further progress was arrested; and on relaxing his tension on the limb to ascertain the cause, it receded to a considerable extent. He now found that the funis—which we subsequently ascertained was very short—had been caught between the nates of the child, which was thus slung up and precluded from descending below the point the strained funis permitted. The tension having been completely relaxed, Dr. Kidd was enabled to slip the coil of the funis over the hip of the limb still in utero, and this difficulty was thus overcome. The delivery of the shoulders was effected without much difficulty. The opposing diameter—the occipito-mental—of the child's head having been converted into the occipito-frontal, Dr. Kidd proceeded with the delivery through the brim of the pelvis; but with all the force he dared to use he could not succeed in this, and being utterly exhausted by his fatiguing exertion in the early part of the operation, he requested me to take his place, and although coming fresh and unwearied to its performance, it was not until after considerable delay, and the use of all the strength and energy I possessed, that I was enabled to complete the delivery of a very large male child. It was thought that its heart pulsated after birth; respiration, however, could not be established. In consequence of the excessive hemorrhage the brim of the pelvis was not carefully examined prior to the operation, but a subsequent examination demonstrated a very great contraction of all its diameters. This patient made a good recovery.

Before I close this communication there is one point connected with the first case I have detailed, which appears to me to possess so much interest in a medico-legal point of view, that I would not feel justified in omitting mention of it. In the *Dublin Quarterly Journal of Medical Science* for May, 1865, page 491, I have published the particulars of three cases wherein accidental injuries

arose to the fetus in utero. The possibility of such accidents in the parturient woman has been frequently questioned, and were circumstances similar to those I have specified to arise in any case wherein suspicious features presented themselves, and no undoubted evidence to the contrary could be found, innocent parties might be inculpated and unmerited odium cast on those altogether blameless. I therefore add the present as a supplement to my former cases. It will be recollected that I have stated in the case of F. K. that "the left parietal bone presented;" that "the promontory of the sacrum projected downwards and forwards to a great extent;" and that "when the finger surmounted it, the upper surface of the projection lay nearly at right angles with the concavity of the bone, to the extent of somewhat more than half an inch." Thus the right parietal bone was in direct apposition with the projecting promontory of the sacrum, against which it was pressed for a lengthened period by the violent action of the uterus. When the delivery was completed a deep depression was found across the centre of this bone from the sagiteal to the coronal suture. We at first thought we could feel a crepitus in the bone, but subsequent examination did not confirm this opinion. I have not seen the child for some weeks, but on the last occasion it was with me I could not discover any appreciable alteration in the depression; still no untoward symptom of any kind had up to that time arisen. The mother was in attendance with the child at the last meeting of this Society, when I had hoped, had time permitted, to have been enabled to submit it for examination together with this communication. I have, however, since lost sight of them, and I regret that I have been unable to procure their presence at this meeting.

ART. III.—*Gunshot Wound of the Knee—Excision of the Knee-Joint.* By HENRY THOMPSON, M.D., Surgeon to the Tyrone County Infirmary, Omagh.

THE history of the operation of resection of the knee is, I believe, as far as the continent of Europe is concerned, as yet incomplete in the want of a case in which the operation has been performed, as a *primary* measure, in consequence of a wound.

Mr. Butcher has published an elaborate and very valuable list of all the known cases that have occurred without one, in which the

joint has been excised for a "recent injury or a gunshot wound," though he alludes to the applicability of the proceeding under such circumstances, and mentions its obvious conditions as depending on the amount of injury sustained by the soft parts as well as the bones. But as, in surgery, more perhaps than in any other art or science, one fact is worth a thousand speculations; and as that fact has happened to fall in my way in reference to this most important operation, I feel that I need make no apology for adding it to those already collected, in the hope that it may contribute to the settlement of the question as to the best course to be pursued in such cases—a question which, as I think, every surgeon will admit, is not yet finally determined.

The simplest injury penetrating the knee-joint is a wound of the most serious character, more so, of course, if it involves the bones or cartilages, and much more so if inflicted by a gunshot with all its consequences of inevitable sloughing and suppuration. A complete recovery from a simple incised wound of the joint is so rare that it must be looked upon as an exceptional escape, yet it has occurred sufficiently often to justify the rule that it should be always attempted. But when there is laceration to any considerable extent, and, *a fortiori*, when the bones are implicated, or the force such as involves *contusion*, it becomes a question whether it be not the best practice to proceed at once to deprive the parts engaged of that peculiarity which renders the injury so dangerous, by the removal or the destruction of the serous shut sac, the distinctive pathology of which is its cause.

This being determined, the question then arises as to how this object may be attained, and my reply would be that where the bones are injured, and the wound inflicted by gunshot or any similar violence, such as a railway crush, for instance, the object will be best attained by excision. Where the wound is merely a lacerated one, with all chance of union by the first intention excluded, it may be possible that, laying the joint open by a wound as extensive as that for excision, without interfering with the ligaments, might induce a healthier and more circumscribed form of inflammation than that which usually follows such injuries.

These reflections have been latterly forced upon my mind by the occurrence of three cases, two in my own practice and one elsewhere in which I was much interested. They were all gunshot wounds of the knee-joint. In the first, which occurred to myself,

the ball passed through from behind forwards. The young man recovered, with a very trifling amount of exfoliation, and with a stiff limb, but after an illness so protracted and dangerous that it determined me as to the propriety of excision should any such case occur to me in future. The second case was one in which the ball did not pass through, but lodged in one of the condyles. This one was fatal, no operation having been performed, and its result increased my determination, the propriety of which was put to the test sooner than I expected, for gunshot wounds of the knee-joint are not common in civil practice, whether rural or metropolitan. Nevertheless, one very soon after occurred to me, the details of which I now proceed to describe, and the result of which is eminently favourable to the advisability of the treatment pursued.

Case.—Peter M'Sorley, a healthy young carpenter, aged twenty-seven, was admitted into the Tyrone Infirmary on the 29th of February, 1868, at six p.m.

At about seven o'clock on the morning of the same day a friend in whose house he was passing the night, in some unexplained and inexplicable fit of desperation, fired a gun at him. In order to avoid the shot, which would otherwise have gone through his heart, he threw himself back on a bed, bending up his knees before him at the same time. The gun went off, and the charge, consisting of shot and slugs, entered the right knee-joint on the outside of the ligamentum patellæ, and passed out in the mesial line immediately above that bone, which was shivered into innumerable fragments, the skin over it remaining uninjured, though scorched and blackened by the powder.

The finger could be easily passed into the joint through the large and ragged wound of the orifice of entrance, detecting extensive injury of the condyles of the femur, and through the orifice of exit a sharp spicula of the shattered patella protruded about an inch. The man, when I saw him, four hours after his admission—having been away on a distant visit—was in a profound sleep, having partaken freely of whiskey during the day, and having had no sleep during the two previous nights, and a dose of laudanum having been administered on his arrival at the hospital.

Under these circumstances I merely removed the projecting portion of the bone, which was catching in the bedclothes whenever he moved, and wrapping a wet napkin round the wounded part let him sleep on until the morning of Sunday, the 1st of March. The

night afforded me ample time to consider the case, and confirm my previously-expressed determination, that should such a case occur to me I should excise the joint. Accordingly, at ten o'clock, a.m., all the necessary apparatus having been previously prepared, the patient was brought into the operating room, and, assisted by Dr. Love, the dispensary surgeon, and Mr. Trenor, the hospital assistant, I proceeded to operate. The leg was held in the extended position, and chloroform having been administered, my first step was to lay open the joint, which I did by a single semi-lunar incision, commencing a little above the projecting part of the inner condyle, traversing the orifice of entrance, and terminating externally about the centre of the outer condyle. The flap formed by this incision was then raised, and the interior of the joint thus freely exposed. It was full of bloody serum and fragments of the patella and femur. These I did not wait to remove, but at once divided the lateral and crucial ligaments, and telling the assistant to bend down the leg, thus threw out the end of the femur, which was found in the following state:—The charge had struck it in the fossa, between the condyles, and had scooped out a piece about the size of a walnut, which was entirely detached. From the upper end of the cavity left by the separation of this piece a fissure extended outwards, completely separating the outer condyle from the shaft, but without displacement, as the periosteum was entire, and kept the split parts together. This fissure ran obliquely upwards, and ended at the back of the bone clear above the condyles. The inner condyle remained unseparated from the shaft, and thus explained the fact of the man having been able to take a step or two after receiving the wound for the purpose of striking his assailant, on whom, before he fell from loss of blood, he left an unmistakable mark of identity, in the shape of a well-blackened eye.

My first thought, on seeing the great extent of the injury, was that it was too much of the femur to remove with any hope of success, so that having cut through the bone about half an inch below the upper end of the fissure, I was about to finish the operation by slicing off a posterior flap when a look at the handsome symmetrical leg lying before me entirely uninjured, decided me on making the attempt to save it, and so carry out my original intention. I therefore rapidly cleared the edges of the head of the tibia, and sawed off the thinnest slice I could accomplish from it. I then turned my attention to the anterior flap, and carefully removed

from it the *debris* of the patella, and all the shot, slugs, and other foreign bodies I could discover; I tied one small vessel at the back of the joint, and then brought the sawn surfaces of the tibia and femur together, that of the former of course very considerably exceeding that of the latter in size; but that could not be avoided without sacrificing so large a portion of the tibia as would destroy all chance of success. So they were placed in as accurate apposition as possible, and the edges of the wound brought together and retained so, by three points of suture, straps of adhesive plaster, pledgets of lint, and a many-tailed bandage; the limb was then placed on its cushion in a box with folding sides, well padded, and he was then slipped over the end of the table into his bed with great ease and comfort. He said he was much easier than before the operation, and did not betray the slightest symptom of shock or faintness. He only complained of a cold sensation in his foot. This led me to examine the tibial arteries, and finding them both pulsating vigorously I covered the foot with a warm sock, and ordered an india-rubber bag, filled with hot water, to be applied below the footboard. He was then ordered a couple of glasses of wine, and left to his repose.

March 1st.—7.40 p.m. Skin hot; pulse 132. Some thirst. Says he is "first rate;" feels no pain or uneasiness, and has slept tranquilly. Free sanious oozing from inside of wound. Bowels have been freely moved, and he has passed water. Complains of nothing but the uneasiness of being confined to his back.

March 2nd.—Slept comfortably the most of the night. Makes no complaint, except that the inner side of the box hurts his perineum. On its being moved down a little he said he was all right. Pulse 120; coldness of foot gone. There has been sufficient oozing to stain all the dressings. Ordered six ounces of wine daily, and beef-tea, a pint. 9.30 p.m.—Had some pain for an hour to-day consequent on some start of the limb. It soon subsided, and he has been since quite easy. Is very cheerful, and full of hope and courage. Pulse full, soft, and 120. Skin cool, tongue moister; no thirst. He has finished his wine. Ordered two glasses more for the night. Bowels have been moved naturally.

March 3rd.—Was a little restless last night from pain in the back, caused by posture. It left him, however, and he slept well for several hours in the morning. Pulse 116. Diminish wine to six ounces. 9.30 p.m.—Quite easy all day. Skin hot to-night. Tongue white and dry; more thirst; slight fulness of thigh; slept

tranquilly in the evening. Omit wine for this night; whey *ad libitum.* Had some stirabout and buttermilk for supper. Bowels natural.

March 4th.—Slept well. Full appearance of thigh continues, but no tension, or redness, or pain. Pulse 116. Skin hot, and tongue white. May have his three glasses of wine to-day. Evening.—Pulse 108. Dressings beginning to have bad smell.

March 5th.—Had a pretty good night, somewhat disturbed by starting, of which he now complains for the first time. Skin cool, pulse 96; tongue whitish, with red tip; appetite good; thirst slight. Free brown purulent discharge appearing through the dressings, and flowing along the leg. The bed, dressings, and all being dirty and offensive they were removed to-day. The inner half of the wound had united; brown pus was issuing from the outer side and from the gunshot orifices, which were occupied by shreddy sloughs. The limb lay in good position, and showed no tendency to any kind of displacement. It was raised, and fresh dressings laid under it; wet lint, covered with sheet gutta percha, over the wound; and the box, with clean pads, having been reapplied, he was lifted up and slipped over into a clean fresh bed, placed in a line with the one he lay on. Ordered eight ounces of wine daily, beef-tea, and meat. Evening.—Has been most comfortable all day; in excellent spirits; pulse 108; skin slightly hot.

March 6th.—A good night. Pulse 96. Suffers no pain. Dressings stained by discharge. Evening.—Had some uneasiness in knee to-day; but finding it was caused by his head and shoulders being too high, a pillow was removed, and he has been easy since.

March 7th.—The best night since operation; perspired slightly; bowels twice open yesterday. Skin cool; pulse 92. No discharge from inner side of wound; that from outer abundant and healthy. The dressings were changed to-day. The pain caused by raising the limb for the purpose not greater than in any compound fracture; sloughs separating quickly.

March 8th.—Pulse 84; skin cool; several large sloughs came away from interior of joint. Wound looking healthy.

10th.—Sloughs coming away daily, and discharge diminishing. Dressing changed from wet lint to calamine cerate, with compresses of tow and gentle pressure. Gets five glasses of wine in the twenty-four hours.

15th.—Several pieces of bone, with grains of shot and sloughs, have been removed daily from the wound chiefly above patella.

There is a very profuse purulent discharge, but his strength keeps up well, and all his functions are healthy. He has had no medicine of any kind since the operation. The strictest attention is paid to cleanliness, the wound being dressed daily, and the bed changed as often as necessary.

17th.—An attack of diarrhea yesterday evening, continuing all night; evacuations feculent.

℞. Tinct. opii. gtt. xx.
Tint. rhei. c. ʒi.
Aqua cin. ʒss. m.
Ft. haust.

Evening.—No motion since. Omit stirabout and beef-tea, and change sherry for port wine; to have boiled rice with his meat, repeat draught at bedtime.

18th.—Bowels open three times this morning without pain. Discharge from wound healthy, and much less. Some paper wadding in a state of pulp came away to-day. He takes ʒss. of chalk mixture, with five drops of tincture of opium thrice a day, and a draught with twenty drops of tincture of opium, at bedtime.

March 20th.—Bowels quiet since yesterday. Omit medicine.

26th.—A piece of bone to-day from the orifice of exit. A splint of wet leather was applied to the back of the limb to-day from the middle of the thigh to lower third of leg.

28th.—Splint, quite hard and firm, was removed, trimmed, lined with soft lint, and reapplied.

April 6th.—The wound dressed every day since, several small portions of bone, shot, paper, &c., being removed from time to time, the presence of which keeps up the discharge from the shot wounds. General health excellent. Great advantage manifest from the leather splint, which keeps the limb quite firm and steady, and by means of which it can be raised with the greatest ease. The wounds have been latterly dressed with slips of lint wet in tincture of matico, covered with others dipped in a solution of carbolic acid.

April 12th.—Showed me to-day how he could move the whole limb in one piece, rotating the foot from side to side.

16th.—Removed a slug from orifice of exit.

18th.—A small bit of bone removed.

April 29th.—The limb was taken out of the leather splint to-day, and found quite firm at the knee.

May 4th.—A bit of bone removed from bottom of sinus. Wound

now dressed with lint wet in a solution of sulphurous acid under the carbolic acid, and it has had a remarkable effect in hastening the healing process.

10th.—Two-thirds of incision healed, a third remaining not yet cicatrized in the centre. The limb was taken out of the case to-day, and seemed perfectly firm, resisting any attempt I made to produce motion. It is quite as firm as could be expected in a compound fracture of same age.

May 14th.—Removed a bit of bone the size of a large pea to-day from the orifice of exit, from which there continues more or less discharge. Limb quite firm. Removed box, and bandaged it up with a roller in its leather case, allowing him to lie on his side, at which permission he expressed the greatest satisfaction.

May 15th.—The removal of the last bit of bone has produced a wonderful change for the better. No discharge from sinus to-day, and wound cicatrizing as fast as possible. Sits up in bed every day now. The limb is quite rigid, and not more than two inches shorter than the other. This is curious, for, as I should have mentioned before, there were two inches and a half of the femur removed, exclusive of the thin slice of the tibia, which was not more than an additional eighth in thickness, except in the centre, where the ridge exists that projects between the condyles, where, of course, it was thicker. There can, however, be no mistake about the fact, that there is not a loss of more than two inches in length.

May 18th.—At this time I was obliged to leave home, and was away until the 1st of July. I left orders that he was not to be allowed out of bed for a week after the complete cicatrization of the wound. It was not very long until this was completed, and at the end of the prescribed period he was allowed out of bed, and on my return I found him up and going about with a crutch and a stick, and able to bear sufficient weight on the limb to enable him to take a step with the other. He had discarded the leather case, and the limb was without any support whatever. The wound entirely healed, and he was daily acquiring some additional power over it. I directed the hospital steward, who is a carpenter also, to ascertain how much would be required to be added to his heel to make up for the deficiency in length, and his report was, "Exactly one inch and a half." The case is thus complete, and the man might have been at home a fortnight ago, had he not waited for my return.

This operation is one which I had never seen anyone else per-

form; but I had done it once before myself, and successfully, as far as the operation was concerned, bony union having taken place; but the patient died two years after of visceral disease, which was not detected at the time of the operation.

I was, therefore, obliged, of course, on both occasions, to depend on the description of others, and my own pretty large experience of operations in general.

I did not adopt the plan most recommended; in fact, I could not see why I should make three separate incisions when one would serve my purpose. I therefore adopted the single semi-lunar incision, and found it quite sufficient. The only other point in which I differed from the mode most approved of was that I sawed the bones from before backwards, and not from behind forwards, and found the former plan perfectly easy, and unattended by difficulty or danger. The saw I used is one I have been in the habit of using in all cases for many years past. It is on the same principle as Butcher's—a narrow blade strained in a frame, but the blade is three inches longer, and the frame is divested of all the useless top hamper which makes Butcher's saw top-heavy and unhandy. Mine has also a good efficient handle like that of the old amputating saws. The blade is fixed in hexagonal, not cylindrical pivots, so that it is firmly held in whatever position it is placed in, and can't turn, and it is strained by a bar running through a *square* slot in the top of the frame, and shortened or lengthened by a nut with a milled head. I cut the pattern out on a piece of paper, accompanied by a short description of what I wanted, and sent it to Weiss several years ago. He sent me the saw a fortnight after, and I have no hesitation in saying that it is the best I ever had in my hand for general use. Comparing the operation of excision of the knee-joint with amputation either above or below the joint, I am impressed with the conviction that the effect on the constitution, which we call *shock*, is less in resection than in amputation, and this I attribute to the circumstance of no large nerve being divided in the former operation.

As to the utility of the limb after excision of the knee, in my opinion there can be little doubt that it is preferable to any artificial substitute. In the case which is the subject of this paper, the patient very much prefers it, and his judgment on such a question is not to be despised.

An ankle-joint, moved by the voluntary power of the muscles of the leg, is an advantage not to be attained by any artificial means,

however ingenious, and one which, no doubt, renders progression much more easy and satisfactory. Then there are no wear and tear, no constant repairing of old legs and procuring of new ones, no straps nor buckles, nor any of the many other inconveniences inseparable from the necessity of carrying about an artificial limb.

ART. IV.—*Notes on the Mediæval Leper Hospitals of Ireland.* By T. W. BELCHER, M.A., M.D., Dub.; Fellow of the King and Queen's College of Physicians in Ireland; and Physician to the Dublin Dispensary for Diseases of the Skin.

AMONG the many contributions to antiquarian lore of that eminent member of our own profession, Sir James Young Simpson, few are more interesting than his learned papers entitled "Antiquarian Notices of Leprosy and Leper Hospitals in Scotland and England."[a] As regards Ireland, however, I am not aware that there is any published account of Mediæval Leper Houses; and I have here attempted to collect a few "*disjecta membra*" to supply to some extent this historical want, until some one better qualified than I am, can give as full a history of our Leper or Lazar Houses as Sir James Simpson has given of those of England and Scotland.

The following is a short summary of the facts collected by Sir James Simpson regarding the extent and constitution of these hospitals, and I give it here because it applies equally to those of our own country, which, like all others, were founded on an ecclesiastical basis.[b]

From information collected by Sir James Simpson from English and Scottish MSS. and records—from *Dugdale's Monasticon Anglicanum*, *Semler's Historiæ Ecclesiasticæ Selecta Capita*, *Schilling's Commentio de Leprâ*, and other authorities—we learn that a disease, popularly known as leprosy, was everywhere endemic from the tenth to the sixteenth century, and that against it princes and courts enacted laws and popes issued bulls, particularly Alexander III., who issued a famous bull—"De Leprosis"—regarding the ecclesiastical separation and the rights of the infected. A particular order of knighthood, that of St. Lazarus, was instituted to care for the sick, particularly lepers, one of whom

[a] Edin. Med. and Surg. Journ., Vols. lvi. and lvii.

[b] Taken from my Edition of Neligan on Diseases of the Skin. Dublin, 1866. Pp. 315, &c.

they had had to elect as their master, until countermanded by Pope Innocent IV. They separated from the Knights Hospitallers about the twelfth century.

In the middle ages leper hospitals were common everywhere. In 1226 there were 2,000 of them in France, limited as its territorial extent then was, while in England they were numerous and wealthy. They were receptacles for infected persons—not medical institutions, because the disease was considered incurable—and were mostly religious establishments, under the sway of some neighbouring abbey. By papal order they all had chapels and ecclesiastics. Thus, in the leper hospital of St. Giles, at Norwich, there were a prior, eight canons regular, two clerks, seven choristers, and two sisters, to minister to the wants of eight bed-ridden lepers. At Illeford, in Essex, they had very hard religious duties, no end of prayers occupying them from early morn till near midnight; and at St. Julian's, at Saint Alban's, Abbot Michael made some very significant rules "de accessu mulierum." From the extant laws of Sherburne Hospital it seems that refractory lepers were occasionally chastised with the birch, "modo scholarium." The lepers had abundant and good diet and clothing; and, from some extracts from MS. diet rolls and clothing lists of the lazar houses, it would seem that not only were all their wants provided for, but that sanitary rules of the best kind prevailed among them. They were often regarded as objects of compassion, and yet were often persecuted. Thus kings and queens used to visit them, wash, and sometimes kiss them, to exhibit pious humility; while, on the other hand, Philip V. and Charles VI. of France enrolled themselves among scoundrels of the first water by burning these poor wretches alive, to grasp their hospital endowments. Sir James Simpson proves that this disease existed in Europe before the Crusades, and was not brought to England by the returning warriors, as is generally supposed, since leper houses existed in various places long before the occurrence of the first crusade of Peter the Hermit. The largest leper hospital in England was at Sherburne, near Durham, and was built by Bishop Pudsey in 1181. In the sixteenth century, when this disease had nearly disappeared, secondary cases of the then new disease—syphilis—were largely admitted to the leper hospitals, which at that period were almost empty. In Scotland the lepers used a rattle to warn persons of their approach, and some similar usage prevailed in Italy. By English law they were classed as idiots, or insane, were counted dead, and could not inherit. The

church performed burial rites over a leper on his admission to hospital; he was clothed, and in every respect treated as a corpse in *foro ecclesiæ*. In France, until lately, the rituals retained the offices for the separation of the leper from the living. They appear to have been most touching, and must have been heartrending to the miserable outcast. They were concluded by the significant act of throwing a shovelful of earth on the leper.

Although Sir James Simpson refers to *Ledwich's Antiquities of Ireland*, as giving information respecting leper houses in this country, I have not found account of any such; all Ledwich says is that the ancient Irish were subject to leprosy; contracted, according to general opinion, from their constant use of raw meat; and that *aqua vitæ*, or whiskey, was held in great repute among them as an unfailing specific for its cure. Hence, perhaps, the national attachment of our countrymen to that useful medicine.

So far as I have been able to ascertain, the Irish houses of any note were Anglican foundations; but frequent mention of the disease is made in ancient records. In these records the term leprosy seems to have indicated merely cutaneous disease, and not any particular kind or variety. Thus, for example, small-pox is spoken of as leprosy.

(From Report on Table of Deaths—Census of Ireland, 1851.)

The first notice of leprosy in Ireland occurs in *Colgan's Acta Sanctorum*, from which it appears that, A.D. 432, "St. Patrick maintains a certain leper in his house, and washes his sores with his own hands."

A.D. 546, "Nessan, a leper, died."—*Annals of Innisfallen.*

A.D. 551. "St. Nessan, the leper [*Lobhar*], died."—*Annals of the Four Masters.*

A.D. 555. "Nassan, the leper, died."—*Annals of Clonmacnoise.*

A.D. 550. "The pestilence, which is called *samtrusg*, the mange, scurvy, or leprosy, raged this year."—*Chronicon Scotorum.*

Numerous entries of this kind occur showing the recognized existence of some disease or diseases called leprosy. Soon after the first Danish invasion, A.D. 835, we thus find the first mention of a leper hospital in the Annals of Innisfallen, under date A.D. 869—"Devastation of Armagh by Arlaf, so that the city was burned with its houses and hospitals [*nosocomiis*, or leper houses."]

From *Archdall's Monasticon Hibernicum* it appears that the monastic leper houses commenced very soon after the Anglo-Norman invasion. In A.D. 1185, a leper-house which had pre-

viously been established at Waterford, was confirmed to the poor through the Benedictines; and in 1192, another was erected at Kilbrixy, County Westmeath, and dedicated to St. Bridget. In 1344, the Hospital of St. Stephen was erected in Dublin on the site at present occupied by Mercer's Hospital, where the cemetery still exists. The present St. Stephen's Church, in Upper Mount-street, is the successor of the parish church of St. Stephen, which in turn was the successor of the hospital and hospital church, suppressed at the general dissolution of religious houses in the reign of Henry VIII.

There were beyond doubt many more leper houses in Dublin; but, strange to say, all records of them seem to have perished, while preserved in other places of lesser note. One stood on the rising ground north of Townsend-street, formerly called Lazar's Hill; and in this locality, tradition says, many miraculous cures of lepers were performed.

This hospital seems to have been the same as "The Steyne Hospital, founded by Archbishop de Loundres, about the year 1220, in the district of Le Steyne, or the Stane, otherwise called Lazar's Hill, or Lazie Hill, about where Townsend-street is now."—(*History of Mercer's Hospital*, by Horatio Townsend, Esq. Dublin: G. Herbert, 1860.)

According to the Rev. Dr. Reeves, who gives it on the authority of the *Repertorium viride*, a statement of the Dublin churches, written by Archbishop Alan, in 1523, St. Stephen's was a leper hospital; and Dr. Reeves further remarks that the church of Ballyloucher, or Ballylower, near Kilgobban, was a dependency of St. Stephen's hospital—(*Calend. Cancell.* p. 157, n. 69); and that the Irish word Ballylower signifies Leperstown, which has been corrupted into Leopardstown. This statement as to St. Stephen's hospital is corroborated by the following, extracted by Whitelaw (*Hist. of Dublin*, Vol. i., p. 391), and supposed to be dated about 1360 or 1370:—

"A gift from Ellena Multon to God and the Blessed Virgin, and St. Stephen, the proto-martyr, and to the poor lepers of the city of Dublin, resident therein, of two acres of ground whereon stood the chapel of St. Stephen, near Dublin, with a small meadow called —— Mary's, to the east of the said chapel, to hold in perpetual charity for the support of the said poor for ever."

In the year 1408, reign of Henry IV., there was a leper house near Wexford, for Archdall says (p. 759):—"King Henry IV., on

the 26th of January, 1408, and 10th year of his reign, granted to the son of William Rochford, during life, the custody of the hospital for lepers, under the invocation of the brethren and sisters of St. Mary Magdalen, near Wexford, with the lands, rents, possessions, churches, tithes, &c., thereunto belonging, the said John to support the houses, buildings, &c., and to defray all other expenses at his own proper cost." And respecting others, "in the early editions of *Ware's Antiquities of Ireland* (although not in the ordinary authorities), we read that after Hore Abbey, founded for Cistercians, by David MacCarwil, Archbishop of Cashel, in 1272, was erected, the hospital built by David de Latimer for lepers, b united to this abbey." In or about 1376, "we read in *Whitelaw and Walsh's History of Dublin*, of a grant to the poor lepers of the city of Dublin;" and in 1421, we find another notice of "the leprous house of St. Stephen, near Dublin."—(*Report on Tables of Deaths*, p. 91.)

In 1467, Archdall says, "a hospital for lepers was founded under the invocation of St. Bridgid, at the village of Hospital," in the county of Limerick; and about the same time, says Sir W. Wilde, a similar institution was built and endowed at Dungannon, in the county Tyrone.—(*Report on Table of Deaths*, p. 94.)

Previous to the time of Henry VIII., there was a leper house in Galway, for in the life of Bishop Kirwan (Meehan's translation), quoted by Sir W. Wilde, we read that: "in 1543, in the eastern suburb of Galway, stood the building of St. Bridgid's church, a long time inhabited as a lazar house; this place, almost destroyed within our own recollection, did he [Bishop Kirwan] re-erect in 1648."—*Report on Tables of Deaths*, p. 108. "And he laid, too, the foundations of the church sacred to St. Bridgid, which the lepers were wont to frequent for hearing mass."

In *Hardiman's History of Galway* an assertion is made (regarding this hospital), respecting the mode of its support, which is of some interest. It is professedly taken from the "*Town Annals*," which Sir W. Wilde states are not now accessible; it reads thus:—

"St. Bridget's hospital, in the town of Galway, was founded for the poor of the town, and each burgess was obliged in his turn to send a servant to collect alms every Sabbath day for its support—a custom which was long after observed. This charitable institution was fortunately completed in the year 1543, when the Sweating Sickness broke out, and raged with great violence, destroying multitudes of the natives, and particularly the tradesmen of the town."

At Dungarvan, says Archdall, "an hospital for lepers was built here and endowed under the invocation of St. Bridgid, but we know nothing further of it."—P. 689.

Of the leper-house at Hospital, near Lismore, the date of the foundation of which I have already noted, we know nothing more than is told us by Archdall (p. 694), who says, "an hospital for lepers was founded here under the invocation of St. Bridgid, to which several lands did belong, as appears from a registry compiled sometime after 1467, when the master of the hospital, styled Prior of Lismore, was in his 120th year. At the time of the general suppression, these lands were unknown."

Mention has been made of the Waterford Leper Hospital, and more than mere mention ought to be made of it, because it is the only one actually remaining in use, and bearing its original name at the present day. It was, according to tradition, founded by King John, and was endowed for lepers by the Power family. "This hospital (observes Archdall) must have been erected before the Benedictine abbey (in Waterford), for John, Earl of Morton, in his charter to that abbey, confirmed the leper house to the poor of the city."

In *Smith's County History of Waterford*, written before 1745, the following account is given of this institution:—

"The Leper House or Hospital of St. Stephen, in this city, situated in St. Stephen-street, was first endowed by the family of the Powers, with the lands called Leperstown, in the parish of Killea, about five miles from this town; they are set by the master of the hospital, who is appointed during pleasure by the Mayor, Sheriffs, and Commons, at a small salary, and has a clerk as an assistant. It is also endowed with other lands and tenements in and about the city. Formerly about fifty poor used to receive a yearly allowance by the master's hands. But as it was thought that a publick infirmary would best answer the intent of the pious benefactors, since the leprosy is not a disease now much complained of, it has been thought proper to endow an infirmary for the reception of such sick and wounded poor as shall offer themselves to the attending physician or surgeon to be cured. There are at present (1745) two houses fitted up with beds and other accommodations for forty sick; one of these houses is endowed by the Earl of Tyrone, who is possessed of the estate of the founders in this county, by a fund of £3,110, put to interest at 5 per cent. for this purpose, the house being given by the city. As these houses are

contiguous, the same persons attend both. The physician attends gratis, and the surgeon has a salary from the city of £30 per annum, and £20 from Lord Tyrone. There is one housekeeper at £6 per annum, and four nurses at forty shillings per annum each. Out of the remainder of the leper fund the Corporation gives £100 a year to decayed housekeepers." I suppose the funds of this hospital are still fairly applied, and have neither been confiscated nor jobbed away. In these days when our legislators assume to tear up our ancient landmarks, to alter men's wills, and dispose of their property very differently from the intentions of the testators, it is refreshing to find in Ireland at least *one* ancient remnant of the true Christian charity of past ages, which has survived the attacks of the legal robber and the unholy usurper. The last recorded case of a leper in this hospital, or, indeed, in this country, occurred in 1775; but should any disease of this kind—as it may—become again prevalent in Ireland, the citizens of Waterford will have no occasion to found an hospital for its treatment. Whatever may have become of the endowment of these houses, their own disappearance is thus accounted for in Dr. Gerard Boate's well-known *Natural History of Ireland*, first published in 1652 (p. 184):—" The rickets are of late very rife in Ireland, where few years agoe unknown; so on the contrary it hath been almost quite freed from another disease, one of the very worst and miserablest in the world, namely, the leprosie, which in former times used to be very common there, especially in the province of Munster; the which therefore was filled with hospitals, expressly built for to receive and keep the leprous persons. But many years since Ireland hath been almost quite freed from this horrible and loathesome disease, and as few leprous persons are found there as in any other countrie in the world; so that the hospitals erected for their use, having stood empty a long time, are quite decayed and come to nothing!" Dr. Boate proceeds to account for the disappearance of the disease, which he thinks was " merely through the fault and foul gluttony of the inhabitants in the excessive devouring of unwholesome salmon," and states that the English at an early period made severe laws against taking salmon out of season, and so caused the disease to disappear.

As regards the house at Kilbixy, the foundation of which has been already noted, all we can gather is taken from Archdall, who says (p. 720):—" This ancient town, in the barony of Moygoish, and about a mile west of Iristemagh, was adorned with a castle, erected by Hugh de Lacie in 1192, and a monastic edifice, or rather

an hospital, built for the support of lepers, and hence it acquired the appellation of the Leper House of St. Brigid."

In the County of Down there were formerly leper houses at Downpatrick and at Kilclief. Of the former Archdall says (p. 118) this hospital was dedicated to St. Nicholas, and, with the hospital of St. Peter at Kilclief, was, on the 20th April, 1413, granted in custodium to John Young, John Molyn, and Walter Celey, with all their lands, tenements and appurtenances, being then in the King's hands for certain causes; to hold the same as long as they should continue in his Majesty's possession.

There was formerly a "Leper's Old Hospital of St. Stephen's" in Cork. It was governed by a prior; and later (temp. Ric. II., and Hen. IV.) by a guardian appointed by the King. It gave place to the parish church of St. Stephen, to which was attached, as an endowment, the landed property of the leper hospital. This parish, with some others, was ultimately incorporated into the union, now known as St. Nicholas's, while Baron Worth's Blue Coat Hospital was built on the site of the church. It is still known as St. Stephen's Hospital.—*Caulfield's Sigilla Ecclesiæ Hibernicæ Illustrata*, pp. 28, 29.

There is much information about the original lands of this hospital, and of those subsequently given to it by Baron Worth, in *Smith's History of the County and City of Cork*, Vol. i. (2nd ed. 1774), pp. 383, &c. The processes of spoliation and family jobbery are splendidly exemplified by the present condition of this institution, which, thanks to the good old system of trustees for corporate property giving perpetual leases at nominal rents to their own friends, enjoys at present only a small part of the revenues which Baron Worth left to it in addition to the leper hospital property.

For the preceding information as regards Cork I am indebted to my learned friend Richard Caulfield, Esq., LL.D., F.S.A., the well-known antiquary, who has also supplied me with further notes respecting leper houses in his native city and county. In a letter to me he says:—"I have just alighted on an abstract of the will of John de Wynchedon, citizen of Cork, executed the Octave of the Apostles Peter and Paul, 1306. This is probably one of the oldest Anglo-Irish wills extant. It is amongst the Roche MSS. in the British Museum. He orders his body to be buried with the Friars of the order of the blessed Augustine of Cork [now called the Red Abbey]. He leaves 200lbs. of wax to be put on the linen to cover his body; [amongst his bequests] 'to the lepers of St. Stephen's, of

St. Mary Magdalen of Shandon; to the lepers near the bridge opposite the Friar preachers [St. Dominick's Abbey, where the mill now is, near the late Cathedral]; to the lepers of Glenawir [Glenmire],' and to other houses."

In the Pipe Roll of Cloyne, which Dr. Caulfield edited some time ago, the following passage occurs:—

"Leprosi de Clone tenent de domino [that is the Bishop], acrem tenæ ubi capella sancti Miehâelis est et tenent per servitium ii*d.* per annum, et per servitia fidelitatis, communis sectæ curiæ."

"The Church of St. Brandon [in Cork] stood on the north side of the river, on one side of the road leading to Youghal, where there is still [says Smith in 1749] a burial ground. The tythes, and a considerable part of the lands of this parish, were formerly appropriated to the maintenance of a leper house."—Smith's *op. cit.*, Vol. i., p. 381. Among the relics, which, Archdall [p. 170] says, "were religiously preserved" in Christ Church in this city, was "St. Patrick's high altar of marble, on which a leper was miraculously carried from Great Britain to Ireland."

I have now endeavoured to record and note on the existence of leper hospitals as follows:—

Armagh.
St. Stephen's, Waterford.
St. Bridgid's, Kilbixy, Westmeath.
St. Stephen's, Dublin.
Lazar's Hill, Dublin.
St. Mary Magdalen's, Wexford.
David le Latimer's Hospital, attached to Hore Abbey—a Cistercian foundation.
St. Bridgid's, at "Hospital," Lismore.
Dungannon, County Tyrone.

[This Sir William Wilde mentions, apparently on authority of Archdall; but I do not find any note of it in his *Monasticon.*]

St. Bridgid's, Galway.
Dungarvan, County Waterford.
St. Nicholas's, Downpatrick.
St. Peter's, Kilclief, County Down.
St. Stephen's.
St. Mary Magdalene's.
St. Dominick's, and
St. Brandon's, Cork, and one more at
Cloyne.

Further researches will probably largely increase this list; and gain information as to the property and discipline of these institutions. Perhaps I should add to it that "In the *Annals of Kilronan*, and of the *Four Masters*, under the date A.D. 1232, we find recorded the death of 'Fachtna O'Halghaith,' Comharb [Vicar] of Drom Muchada, Drumacoo, and official of Ni Fiachrath [the Diocese of Kilmacduagh], a man who kept a house [of entertainment] for strangers, lepers, and for learning and instruction." This is one of the earliest accounts by a contemporaneous writer of an Irish Hospital in Christian times."—(*Wilde, Report on Tables of Deaths*, page 24.) The late eminent Dr. O'Donovan stated that a branch of this "O'Halghath" were also hereditary physicians, and a fragment of a MS. which once belonged to them is still in existence. The name is now Anglicised "O'Halley." The celebrated astronomer, Edmund Halley (ob. 1742), was of this family, as also was the learned Dr. Darbey Halley, Roman Catholic P.P. of Dungarvan, Ardfinan, county Tipperary, who died in 1628.

Long prior to the introduction of Christianity into Ireland, when the regal palaces of Tara and Emania existed, there was attached to the latter "the House of the Crimson Branch," where the warriors of old hung up their arms and trophies, and near to this stood the *Broin Bearg* (or "House of Sorrow") where the diseased and wounded were cared for.—(*Wilde's Report on the Status of Disease, Census*, 1851, page 89.) From the twelfth century to the Reformation, the care of the sick, poor, and the needy was confided to the monastic orders, who seem to have done their work well, according to the ideas and knowledge of their own times. In Dublin we had general hospitals belonging to the Priory of St. John the Baptist, in Thomas-street, with 50 beds, the Steyne, already noticed, Allen's Hospital, the Priory of Kilmainham, and probably others. But all these were suppressed at the time of the Reformation; their revenues were given to greedy courtiers, and their records perished. The clumsy, tax-imposing legislation of our own day is vainly endeavouring to make good to our sick and our poor what the unscrupulous plunderers of a past age selfishly deprived them of. In the sister country St. Bartholomew's and St. Thomas's Hospitals, and a few others, are the only remnants of that true charity for our poor and sick brethren, which the original donors never intended to be used for the foundation of a set of selfish nobles.

ART. V.—*Ascending and Descending Breathing; its Value as a Symptom, and its Mechanism.* By JAMES LITTLE, M.D.; M.R.I.A.; Fellow College of Physicians; Physician to the Adelaide Hospital.

IN 1818 Dr. Cheyne published, in the second volume of the *Dublin Hospital Reports*, the case of a gentleman whose body he had examined, in which the only highly-marked pathological change discovered was conversion of the muscular structure of the right and left ventricles of the heart into fat. Along with other symptoms he noticed, during the last nine days of the patient's life, a peculiar irregularity of breathing; "it would," says he, "entirely cease for a quarter of a minute, then it would become perceptible, though very low; then, by degrees, it became heaving and quick, and then it would gradually cease again. This revolution in the rate of his breathing occupied about a minute, during which there were about thirty acts of respiration." He tells us that he noticed the same description of breathing in a relative of this gentleman, who also died of some disease of the heart, the nature of which he did not know. Other examples of this phenomenon were observed by Dr. Stokes; and as they all occurred in the subjects of fatty degeneration of the heart, he considered it, when present, pathognomonic of that disease. His description will convey to those who have never had an opportunity of witnessing it, more accurately than do Dr. Cheyne's words, an idea of its character. Among the indications of the malady he says there sometimes occurs "a form of respiratory distress, peculiar to this affection, consisting of a period of apparently perfect apnea, succeeded by feeble and short inspirations, which gradually increase in strength and depth until the respiratory act is carried to the highest pitch of which it seems capable, when the respirations, pursuing a descending scale, regularly diminish until the commencement of another apneal period."

After the publication of Dr. Stokes's opinion this form of breathing was considered absolutely indicative of fatty disease of the heart, until 1860, when Dr. Seaton Reid, of Belfast, communicated to the *Dublin Hospital Gazette* a case in which it existed, and in which the muscular fibre of the heart was found absolutely free from fatty change, but in which there were present incompetence of the aortic and mitral valves, dilated hypertrophy of the left ventricle, and dilatation, with atheromatous degeneration of the

aorta and innominata. Dr. Reid also pointed out what had hitherto escaped observation, that during the respiratory distress the pulse became invariably slow, increasing again in frequency during the apnea.

At one of the meetings of the Medical Society of the College of Physicians last year, my friend Dr. Head read a most interesting account of a patient in whom this kind of breathing presented itself in an exaggerated degree, the cardiac change present being aortic patency, with hypertrophy of the left ventricle, without the slightest fatty degeneration of its fibre. He, however, in this case, discovered, and for the first time, as far as I know, described fatty degeneration of the diaphragm.

At the time Dr. Head made his communication to the society there was a patient, a man of sixty-nine years of age, under my care in the Adelaide Hospital, who presented this symptom, the other indications of illness being shortness of breathing on exertion, syncopal attacks, slight incoherence, and general debility. After his death we were only able to secure the heart for examination; its fibres had undergone fatty change, and the organ was small in proportion to the size of the man, but free from valvular disease.

On the 8th of August a coachman, aged seventy-two, came into the hospital, having been ailing for four months with cough and shortness of breathing, to which, two months before admission, succeeded anasarca, at first of the feet and legs, and latterly of the trunk and upper extremities, the urine being scanty, but not albuminous. In his case the respiratory distress was clearly marked; the periods of apnea varying from ten to twelve seconds, while the ascending and descending respirations occupied about thirty-five; the corresponding changes in the pulse, to which Dr. Reid drew attention, were also present. In a note made on the 14th of August, it was recorded that during ten seconds of the breathing period there were only six systoles of the heart, and these were generally irregular in rhythm and force, while during ten seconds of the apneal period there were fifteen, the sounds were indistinct, and with the first a faint murmur could occasionally be heard at the base. He died on the 3rd of October. During the last ten days of his life he spat a good deal of blood, and during the same period this peculiar form of breathing did not exist. We found the left ventricle much hypertrophied, the aortic valves slightly rigid—sufficiently so to offer some obstruction to the outward current, but they were not incompetent; the aorta

itself was studded with atheromatous and calcareous deposit; the lungs contained several large masses of pulmonary apoplexy.

On the 21st of February this year, a pensioner from the Royal Navy, of the same age—seventy-two years—came into the hospital. For the past three winters, he told us, he had had cough and shortness of breathing. During the summer months he had been pretty well, but as soon as the cold weather began this year the symptoms returned, and in the early part of January his feet and legs became swollen. When he entered the hospital he had very little cough and no expectoration, but he could not lie down at night nor speak except very slowly, on account of the little breath he had. On first placing my ear to his back I heard absolutely no pulmonary sounds whatever; but while I continued listening there became audible first a very feeble breath sound; this gradually increased till, as described by Dr. Stokes, it became intensely puerile, with sonorous and sibilant râles, and towards the base of the left lung muco-crepitus, and then in a reverse manner subsided. The respirations were followed by a period of perfect apnea. From a note made two days after his admission I find that the apneal period lasted ten seconds, and during that time nineteen radial pulses were counted. The respiratory acts occupied twenty-five seconds, and during ten seconds counted off at the height of the paroxysm, thirteen systoles were felt at the wrist. The visible impulse of the heart was considerably extended, the apex striking the chest walls beyond the line of the nipple. With the first sound of the heart there was a loud murmur of greatest intensity over the sternum, on a level with the third interspace, traceable downwards towards the ensiform cartilage, but still more clearly upwards in the course of the aorta; it was an unusually prolonged drawling murmur. The patient was universally anasarcous, and his urine contained blood discs and tube casts, and was coagulable to one-third. He died on the 1st of April. For a fortnight before his death it was noticed that the peculiar kind of breathing was no longer present. We found the left ventricle very much hypertrophied and somewhat dilated; the aortic valves were thickened and rigid, but supported a column of water; the entire arch of the aorta was dilated, and its coats studded with atheromatous deposit. I was myself unable to detect any evidence of fatty change in the muscular structure of the ventricles, but I was anxious to remove any doubt by having it examined by some one who was most thoroughly conversant with structural changes; and my friend Dr. MacAlister

was so kind as to do this for me with care, and he pronounced the fleshy portion of the ventricles absolutely free from any degeneration. The kidneys were both diseased.

The clinical fact therefore remains, that breathing of ascending and descending rhythm occurs in fatty degeneration of the heart, and also in cases in which the left ventricle is hypertrophied as a consequence of valvular or arterial disease.

As far as I am aware, those who have attempted to explain this singular condition have either connected its occurrence with weakness of the right ventricle, or attributed it to some perverted action of the nervous centres.

The day I showed at the Pathological Society the heart of the last patient whose case I have referred to, an explanation of the phenomenon suggested itself to my mind; and though it does not, in my own opinion, quite possess all the requirements of a satisfactory solution, it is perhaps a step in that direction.

It occurred to me to ask what do these two morbid conditions under which the symptom has been observed possess in common. In the one the fleshy portion of the left ventricle is atrophied, and has lost almost entirely the endowments of muscular fibre; in the other it is hypertrophied, and possesses to an abnormal degree muscular power, but in relation to the work each has to perform they may be equally incompetent—the fatty ventricle, in consequence of the degeneration of its own structure; the hypertrophous, in consequence of the increased obstacles which are in front of it.

In health the right and left ventricles, though differing so much in the thickness of their walls, are equally competent for their duties, the right is able to fill the pulmonary capillaries as thoroughly as the left, with the aid of the other forces which contribute to the circulation, fills the systemic; but if an abnormal burden is imposed on the left, if rigid valves narrow its outlet, or permit the blood it discharges at each systole to fall back into its cavity, or if the arterial coats, their elasticity destroyed by disease, no longer help the heart, if the aorta instead of taking charge of each wave of blood as it leaves the ventricle, and propelling it onward by the steady recoil of its walls, is permanently dilated, and allows each portion of blood to remain in its ascending trunk, and so to impede the entrance of that which follows—under any of these conditions the left heart, however hypertrophied, may be quite unable to rid itself of the blood as rapidly as it is supplied to it

by the right ventricle. Blood would, therefore, accumulate in the left auricle, in the pulmonary veins, and in the capillaries of the lungs. That blood, having already absorbed as much oxygen as it required, would fail to produce that impression on the ultimate filaments of the pneumogastric which black blood does, and which impression is converted by the nervous centres into the motor impulse which produces breathing. Breathing would, therefore, cease, and inasmuch as the respiratory act seems to assist in carrying the blood to the left side of the heart, it would no longer be so over-stimulated by fresh supplies, and its contractions would become less frequent and more regular. After a few systoles, however, it would succeed in discharging the red blood collected in its cavities to such an extent that they could receive some of that which lay in the pulmonary veins and lungs. Space being thus gained, the black blood which the pulmonary artery contained would reach the capillaries of the lungs in amount proportionate to that of the arterial which had gone forward, and sufficient air would be drawn into the chest to ærate so much blood. That very act would carry forward a still larger charge of arterial blood to the left side, and make room for the reception, by the lungs, of a still further increase of venous blood, and, as a consequence, a still deeper inspiration would follow, and the deepest would occur when the largest quantity of venous and the smallest quantity of arterial lay in the lungs. The red blood, reaching the left heart, would excite it to those frequent and irregular contractions which accompany the respiratory distress, but frequent and irregular they would be also ineffectual, red blood would begin again to accumulate in the left heart, the pulmonary veins, and the lungs, till at last their capillaries would contain little else, and the exciting cause of inspiration, the venous blood, being no longer present, the act itself would again cease.

Precisely similar conditions might, it seems to me, be supplied by fatty degeneration, for if it were—as I believe is often the case—somewhat more advanced in the left than in the right ventricle, or if, in addition to fatty degeneration, disease of the valves or atheromatous deposit in the aorta were present, the balance between the two sides of the heart would be destroyed. In Dr. Cheyne's original case, indeed, it is mentioned that the aorta was studded with steatomatous and earthy concretions.

In the two last cases I mentioned that the ascending and descending breathing ceased during the ten days preceding death,

and that on examination the lungs were found in the one case filled with masses of pulmonary apoplexy, and in the other compressed by pleural effusion; and it is not, I think, unreasonable to suppose that the obstructions thus created to the passage of blood through the lungs may have so weighted the right ventricle that it no longer possessed an advantage over the left, and the balance between the two being thus restored, the conditions necessary for the phenomenon were no longer present.

It is also worthy of notice that there is no feeling of oppression on the part of the patient during the apnea, a circumstance which, I think, favours the idea that the lungs are at the time filled with oxygenated blood; all the distress is felt while the respiratory acts are being performed. The weak point in the explanation I have mentioned lies in the fact that in most cardiac lesions there is a tendency to a similar stasis of blood in the lungs from obstruction on the left side of the heart, while this form of breathing is of very rare occurrence, it may, I think, be suggested that in the cases in which it is manifested the lesion which has destroyed the balance between the two ventricles has been rapidly produced, while in other cases it has taken place so gradually that, in virtue of the tendency in the several parts of the system to work in harmony, the right ventricle has come to send on the blood only at a rate at which the left can receive and propel it.

In Dr. Cheyne's case, though for some years the patient had been in failing health, there seems reason to suppose that the cardiac mischief took place almost with acuteness. In the three cases recorded in this paper, from the first development of symptoms referrible to the heart, to their termination, only a few months elapsed, while in ordinary valvular disease, following an endocarditis, it is frequently years before the changes have become so great as to compromise life, and while they are in progress the action of the two ventricles may become gradually adjusted, not indeed by the supervention of structural change in the right, but by its nervous centres sending to it only so much force as will keep it working in harmony with the left.

At one of the meetings of the Medical Society of the College of Physicians, when I offered this explanation, Sir D. Corrigan drew attention to the reservoirs for arterial blood provided in diving animals, which enable them to store up a quantity of it to supply the oxygen required in the nutritive changes in their bodies while respiration is suspended, and suggested that the left heart and the

pulmonary veins, during the apneal period, performed an analogous function in these cases.

At the same time Dr. Grimshaw mentioned a very interesting observation, which seems confirmatory of the explanation I offer. Dr. Grimshaw had taken several sphygmographic tracings of the pulse in Dr. Head's case, already alluded to. In that patient there existed permanent patency of the aortic valves, and he noticed that the tracings taken during the breathing period exhibited markedly the collapsing pulse of that lesion, while tracings made during the apneal pause showed no such character, a circumstance which, on my theory, would find its explanation in the extreme loading of the left cavities with arterial blood at that time preventing the returning wave falling into the ventricles, as it ordinarily does in aortic insufficiency.

ART. VI. — *History of Two Cases of Hermaphroditism.* By SAMUEL J. WOODS, M.D., Medical Officer of the Roscrea Union Workhouse and Roscrea Dispensary.[a]

THERE are at present in our workhouse two very interesting cases of abnormal development of the sexual organs, considered as male and female, in children of the same family.

The first subject, who has hitherto been regarded as a girl, is aged thirteen years, and presents nothing particular in her general conformation. She is rather good-looking, intelligent, modest, and without the slightest appearance of masculinity.

She was brought under my notice by her mother, for a tumour in the left labium pudendi, and which she stated had made its appearance about one month previously. On examining the parts, and separating the labia, I found that there was no vagina, but there is an apparently well-developed clitoris, having a slight indentation on its glans, with a prepuce, but no nymphæ. Below it there is a funnel-shaped depression, lined with mucous membrane, capable of containing a hazel nut, and leading to a small orifice, through which she micturates. From this, backward to the perineum, the labia are united, forming a deep groove. The left labium is larger than the right, and each contains what appears to be a testis, or ovary, with a trace of cords. The right testis is very high towards

[a] Read before the Dublin Obstetrical Society.

the inguinal region; it requires a good deal of manipulation before it can be felt, and is much smaller than the left. It is likely that the latter may have occupied a similar position previous to the time when the tumour presented itself visibly, and attracted the mother's attention, it only then having descended to its present place.

On mentioning to the mother this condition of her child, she was much alarmed, and said there was something wrong also with her little boy, whom she had with her in the infirmary, and whom I had daily opportunities of observing—the woman being a wards-maid in this department of the institution nearly since her admission, nine months previously.

This child is four years old. He is large for his age; his abdomen protuberant; his legs, arms, and thighs soft and round, and containing a large amount of fat; yet he is not more feminine in his appearance than boys of his years.

On a first glance, when exposed for examination, the external parts of generation have all the appearance of a female. I may say nearly the same description answers for him as for his supposed sister. In place of a scrotum there exist the outlines of the labia pudendi united at the mesial line, without the deep groove as in his sister, but forming a commissure extending to the perineum. Each side contains a very small rudimentary testis and cord; and he also urinates through an orifice at the base of his elementary penis.

On a uterine sound, and also a catheter being introduced, they passed into the bladder; but the finger in the rectum failed to detect any intervening canal, uterus, or prostate gland. On those occasions the "clitoroid penis" in the elder child seemed to possess erectile properties.

Besides these two children the mother has had ten others, of whom six are living—five males, and one female, all well formed. I questioned her closely as to her having had any previous knowledge of the elder child's state, but she declared firmly she had not the least idea of it up to the appearance of the tumour. She was aware of the deficiency in the younger one, as the medical gentleman who attended her in her confinement had informed her of it.

These children present good specimens of doubtful sex, and as such I have thought it right to bring them before the profession. Records of similar instances are scattered through the works of different medical writers. Dr. Beatty, Sir James Simpson, and others have given ample descriptions of them. Dr. Beatty, in his

Contributions to Medicine and Midwifery, has devoted an entire article to them, in which, following Sir E. Home, he divides them into four classes, viz.:—

I.—Malformation of the male.

II.—Malformation of the female.

III.—Males with such a deficiency of the organs that they have not the character and general properties of the male, and may be called neuters.

IV.—Where there exists a real mixture of the organs of both sexes, although not sufficiently complete to constitute the double organ.

I think the elder child may be fairly ranked in the first class, while the younger corresponds more closely in all respects and characteristics to the third class.

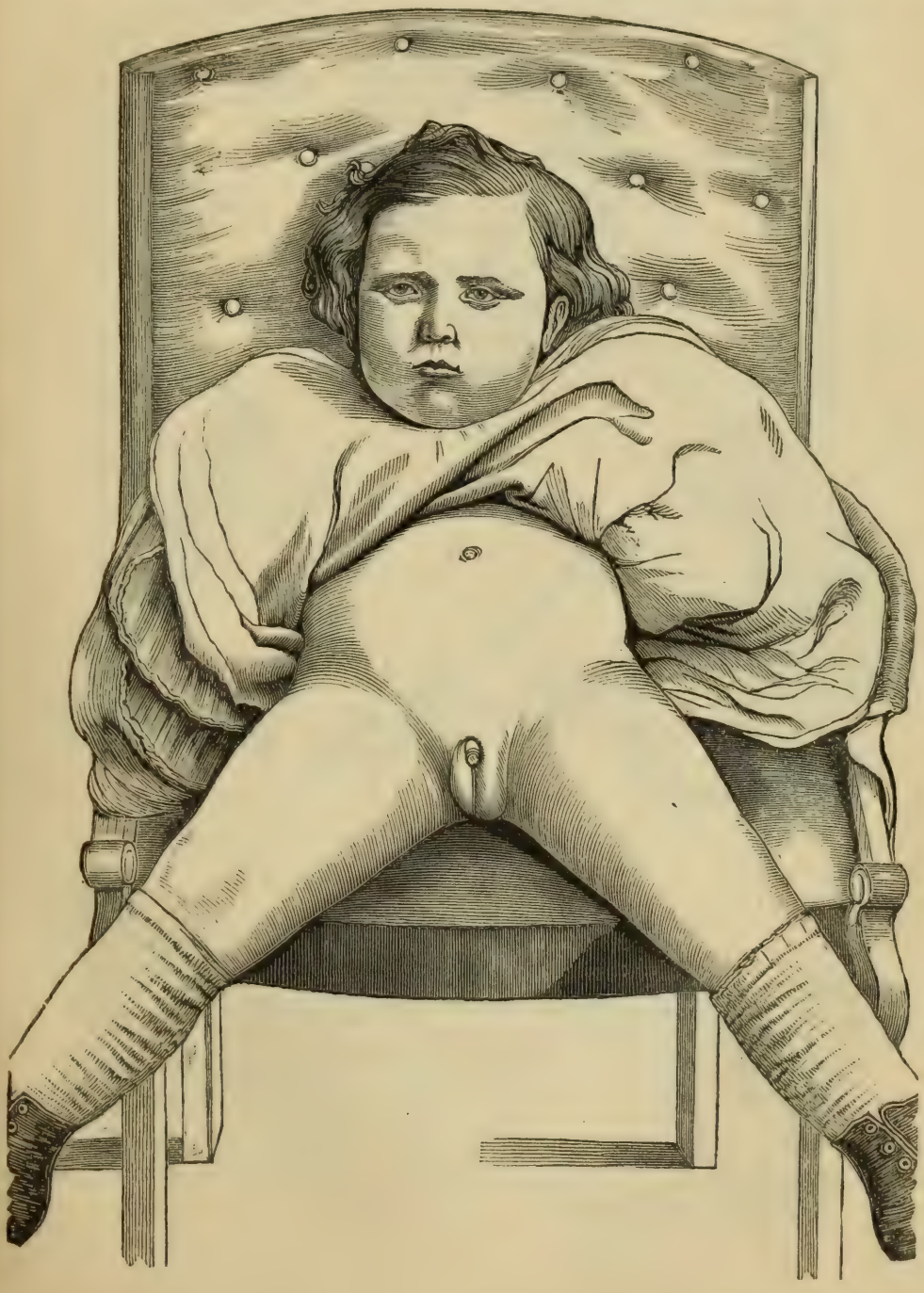
I shall soon lose sight of these children, which I regret. It would be desirable to watch the development of the sexual instincts and desires as they grow in years, and to see in what direction they may tend. Doubts have been raised as to the capability of individuals of this kind possessing or exercising procreative powers; but instances have occurred, where previously none were supposed to exist, but where subsequent events proved it to be otherwise, as the following case will show. The description would be ludicrous, if it were not for the sad fate of the hapless wight whose history it relates.

"In the year 1459, there was a bairn which had the kinds of male and female, called in our language a *scarcht*, in whom man's nature did prevail. But because his disposition and portraiture of body presented a woman, in a man's house of Linlithgow (Scotland) he associated in bedding with the goodman's daughter of the house, and made her to conceive a child; which being divulgate through the country, and the matrons understanding the damsel deceived on this manner, and being offended that the monstrous *beast* should set him forth as a woman, being a very man, they got him accused and convicted in judgment for to be burnt quick for this shameful behaviour."—*Prescott's History of Scotland*, quoted by Beck.

These *lusus naturæ* are, and ever will be, inexplicable. Physiologists assert that up to a certain period of intra-uterine life the sexes are not to be distinguished. Then the genitals begin to unfold themselves, and each sex to be discernible. Nature, as in a freak, stops short the growth of these parts, while the rest of the body progresses to perfection; and at the appointed time, the child comes into the world with these organs "just half made up," to be

a puzzle to the medical jurist, whose opinion is frequently required to define the position and status which persons of this description should occupy in the animal economy, and who is called upon and expected to clear up all doubts. In barbarous ages they were regarded as outside the pale of humanity, and their lives were directed to be sacrificed for the common weal—in fact they were considered monsters, and treated as such.

The accompanying wood engravings, from photographs by



Robinson, will convey an accurate idea of the condition of those children whose peculiar malformation I have endeavoured to describe. While the elder child was being photographed, the pseudo-penis appeared somewhat turgescent, from being handled to expose it for portraiture.





Fig. 1. Diseased Elbow-joint.

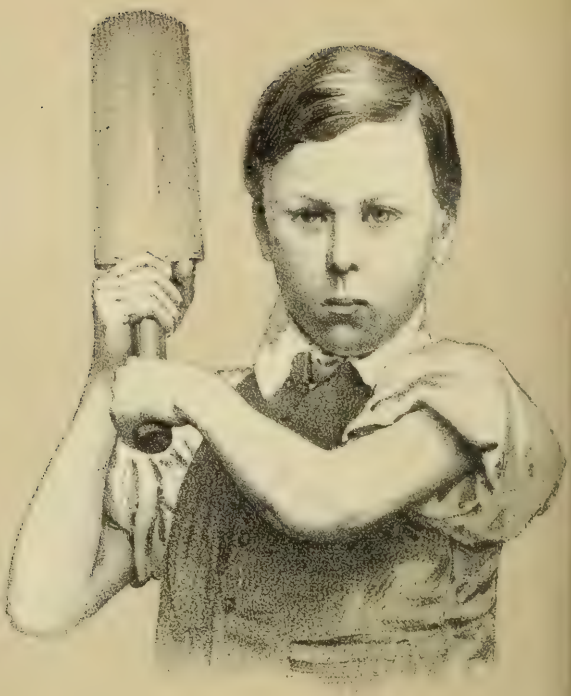


Fig 2. Joint after Excision.

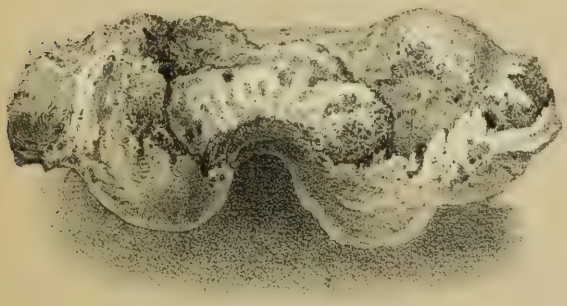




Fig 3. Diseased Bones removed by Excision.
(Life size)

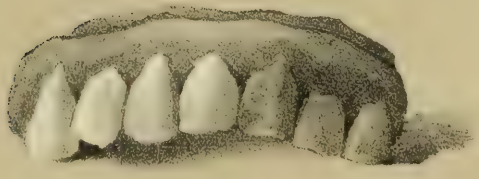


Fig 4. Seven Artificial Teeth (set in Gutta Percha) removed from windpipe by Incheotomy.

Forster & Co Dublin

ART. VII.—*Contributions to Operative and Preservative Surgery.* By HENRY GRAY CROLY, Fellow and Licentiate of the Royal College of Surgeons in Ireland; Licentiate of the King and Queen's College of Physicians; Surgeon to the City of Dublin Hospital; Lecturer on Clinical Surgery, &c.

PART I.

I.—EXCISION OF THE ELBOW-JOINT BY A SINGLE INCISION—SUCCESSFUL, WITH PERFECT USE OF THE LIMB.

II.—RESECTION OF THE HEAD OF THE RADIUS—SUCCESSFUL RESULT.

PART II.

I.—WOUND OF RADIAL ARTERY NEAR THE WRIST—LIGATURE OF THE VESSEL—SUCCESSFUL.

II.—WOUND OF THE PLANTAR ARCH—LIGATURE OF THE POSTERIOR TIBIAL ARTERY—SUCCESSFUL.

III.—WOUND OF THE ULNAR ARTERY AND NERVE—LIGATURE OF THE VESSEL—SUCCESSFUL.

IV.—GUNSHOT WOUND OF THE HAND AND WRIST—PALMAR ARCH WOUNDED—ULNAR ARTERY AND MEDIAN NERVE SEVERED ABOVE THE WRIST-JOINT—ACUPRESSURE—RECOVERY, WITH A USEFUL HAND.

V.—COMPOUND COMMINUTED FRACTURE OF THE METACARPAL BONES OF THE LEFT THUMB AND INDEX FINGER, WITH WOUND OF THE RADIAL ARTERY, CAUSED BY A CIRCULAR SAW—HEMORRHAGE ARRESTED BY ACUPRESSURE—RECOVERY, WITH A USEFUL HAND.

VI.—GUNSHOT WOUND OF THE THUMB—AMPUTATION AT THE METACARPO-PHALANGEAL ARTICULATION—RECOVERY.

PART III.

I.—REMARKABLE AND CURIOUS CASE OF FOREIGN BODY IN THE LARYNX — SEVEN ARTIFICIAL TEETH (SET IN VULCANITE) HAVING ENTERED THE WINDPIPE DURING A FIT OF EPILEPSY—IMPENDING SUFFOCATION — TRACHEOTOMY PERFORMED — FOREIGN BODY EXTRACTED — DEATH THE RESULT OF A VIOLENT EPILEPTIC SEIZURE.

EXCISION of the elbow-joint is now acknowledged to be one of the greatest triumphs of Preservative Surgery; arms, formerly doomed to amputation as the only prospect of saving life, are in the present day rescued by this valuable resource of art; and, as will be observed

by reference to Case I. in this paper, by a timely operation, aided by judicious subsequent management, the patient will be afforded a useful limb, enabling him to earn his bread.

CASE I.—*Excision of the Elbow-joint for Strumous Disease—Recovery, with full power of Flexion, Extension, Pronation, and Supination.*

C. W., aged twelve years, residing in the city, came under my observation in March, 1867, suffering from strumous synovitis of the left elbow-joint; his mother, who accompanied him, said that he was in good health until the month of January preceding, when he received an injury of the elbow by falling on the ice; the joint became painful and swollen after the fall.

On examination I found the elbow-joint flexed, swollen, red, and fluctuating; extremely tender on pressure, especially over the internal condyle; the pulse was quick, and there was general feverishness. I ordered half a dozen leeches to be applied to the joint, and small doses of mercury with chalk, to be taken daily. The limb was subsequently fixed on an angular gutta percha splint to ensure perfect rest.

This treatment was followed by some relief to the acute symptoms. In three weeks a vesicle formed over the internal condyle of the humerus, and soon burst discharging a thin sero-purulent fluid. Quinine mixture was then prescribed, and the ulcerated spot was dressed with lint steeped in cod-liver oil. The patient drove out daily during the spring in a milk-cart to the country, and kept the joint at perfect rest. He continued to take some tonic mixture, and drank plenty of good milk. Nothwithstanding all this, the disease advanced and several abscesses formed around the joint. These were opened from time to time, and discharged an unhealthy fluid. The boy's health became seriously impaired; he perspired copiously at night, and lost flesh rapidly; the joint became much swollen, stiff, and exquisitely painful. He was accordingly, at his own request as well as that of his parents, admitted into the City of Dublin Hospital under my care on the 2nd of May, 1867, on which day a drawing of the limb was taken by Herr Tomsohn (of Forster and Co's.), with his usual accuracy.—(*Vide* Plate I., Fig. 1).

Appearance of patient, and condition of the limb on admission:—Face emaciated and anxious; hectic flush on the cheeks; pulse rapid; profuse night sweats; eyelids tender; left elbow-joint enormously swollen, presenting a conical shapeless mass, which gives an elastic

and a pseudo-fluctuating feel on manipulation and pressure; the tissues are infiltrated, and the integuments present a purplish shining appearance. There are three sinuses over the external condyle; a bright papilla is observed at each ulcerated point, and on introducing a probe a grating is felt in the region of the condyles of the humerus and upper end of the radius and ulna; intense pain is produced by separating the bones by extension, or pressing the bones of the forearm against the condyles of the humerus. The arm and forearm are wasted, and the fingers and hand present an elongated appearance—a characteristic accompaniment of strumous disease of the elbow.

On consultation my colleagues agreed with my view of the case, and it was decided that excision of the joint should be performed, which was accordingly done on the 3rd of June, in the following manner:—

The patient (who had taken, in the morning, an egg with brandy,) was placed on the operation table, and, having been quickly brought under the influence of the "tetra-chloride of carbon," was turned on his side, and the left arm, with the olecranon directed upwards, was grasped firmly by an assistant and steadied. I commenced by making, with a stout scalpel, a single longitudinal incision, about six inches in length, from above the posterior part of the condyles of the humerus, extending over the olecranon process and terminating on the back of the ulna. The periosteum was next divided with a knife used for that special purpose, and was readily detached from the bone with a raspatorium; the soft parts were rapidly dissected and drawn over each condyle of the humerus (especial care being taken to avoid injuring the ulnar nerve, which, by careful dissection, was not brought into view, being drawn with the infiltrated structures *en masse* over the internal condyle with a retractor). The lateral ligaments of the joint were next divided, and by a few cautious touches of the knife, the end of the humerus was freed from the radius and ulna; the articulating surface of the condyles presented a roughened ulcerated appearance, the cartilage having been removed. A narrow bladed saw, with the blade reversed, was applied, and the humerus (above the ulcerated part) was quickly severed from before backwards. The bone on section was found to be firm and sound. The olecranon process of the ulna, and the great sigmoid cavity, with the head of the radius, which were also diseased, were removed in a similar manner.—(*Vide* Plate I., Fig. 3). There was very little hemorrhage; the infiltrated areolar tissue was next removed with a

curved scissors, and the wound was sponged with iced water; no vessel required ligature. The edges of the wound were approximated with iron-wire sutures, and the limb was placed in an angular box splint, with the thumb uppermost. A short splint was placed on the arm to prevent spasms tilting the humerus upwards.

The patient was carried with the "poles and sheet" and placed in his bed in the large ward which opens into the operation theatre. He vomited several times, and was restless for some hours; an anodyne was administered, and an iced lotion was applied to the wound.

June 4—Patient passed a restless night; pulse 120; ordered iced soda-water, and beef-tea. Small doses of opium were given every third hour to quiet the nervous system.

June 5.—Stomach settled; patient slept well; limb lying comfortably.

June 6.—Turpentine enema was administered with O'Beirne's tube.

June 7.—Patient slept well last night; the bowels were acted upon freely by the enema; the discharge from the wound was considerable, and was removed without disturbing the limb, and the parts were cleansed with "Condy's fluid."

June 8—Two of the sutures were removed; warm-water dressing was applied to the wound, the greater part of which has united by the "first intention;" patient continues to take beef-tea, milk, and iced soda-water.

From this date he progressed most favourably, and was soon allowed to sit up in the ward. Cautious passive motion was practised, and the boy was discharged from hospital on the 3rd of July.

I had a photograph taken of him, in June, 1868, by Lawrence, from which the accompanying lithograph has been executed by Herr Tomsohn (of Forster and Co.'s)—(*Vide* Plate I., Fig. 2.) The boy can now flex and extend his forearm on the arm, as well as pronate and supinate his hand; he can play cricket (he was photographed holding a bat in two postions—before the wicket, and with the bat raised to strike the ball); he can wheel a wheelbarrow, and work; his general health is excellent. I exhibited him lately to the pupils at the hospital, when they were assembled in the Operation Theatre to witness some operations. They satisfied themselves as to the result of the case, which many of them watched, with much interest, from the date of the patient's admission until he was discharged from hospital.

Case II.—J. D., aged nineteen years, a native of the county of Kilkenny, residing in Dublin, was admitted into the City of Dublin Hospital (in June, 1864) under my care, suffering from stiffness and disease of the left elbow-joint. He states that ten years previously he had an attack of inflammation in the joint, and since then has not had free use of the limb. He does not recollect having received any injury of the elbow. On examination the upper arm was observed to be wasted, and the elbow-joint partially stiff. There was an ulcerated spot over the head of the radius, and on rotating the hand, the button-shaped head of the bone, stripped of its cartilage, can be seen moving. The rest of the joint appears healthy. The patient having been chloroformed, I made an incision over the diseased part, exposing the head of the radius, and divided the orbicular ligament, and, with a fine saw, removed the head and portion of the neck of the bone; the wound was closed and the arm placed in the flexed position upon a pasteboard splint; cold-water dressing was applied.

The wound healed rapidly, passive motion was practised, to restore the joint to its natural mobility, and the patient was discharged from hospital.

I lost sight of this case, and was lately much pleased to hear from a medical friend that Delaney was in excellent health, and had full power of the joint.

I have since received a photograph, from which the accompanying lithograph was taken.—(*Vide* Plate II., Fig. 2).

Remarks on Excision of the Elbow-Joint.

The selection of cases of diseased elbow-joint suitable for excision is of the first moment.

The extent of disease in the humerus is to be ascertained by careful manipulation of the arm to discover the condition of the periosteum, which, if thickened high up upon the bone, is generally indicative of an amount of disease, prohibiting resection; and in cases where sinuses exist, the surgeon can, by the introduction of the probe, explore the several bones of the joint.

Elasticity of the joint (ascertained by lateral motion, extension, counter-extension, and by pressing the bones of the forearm against the condyles of the humerus) as described in Case I., is indicative of an amount of disease which never can be cured by rest and time; and unnecessary delay in operating, by trusting the resources of nature too long, may, if injudiciously adopted, allow the diseased

action to progress until the case becomes unsuitable for preservative surgery.

Mode of Operating.—There are various methods recommended by operators for excising the elbow-joint; for example:—the H-shaped incision, the T incision, the single long incision. I have no hesitation in giving preference to the last named method, viz., the single longitudinal incision, that which I adopted in the case now reported. It affords ample room, and admits of early passive motion of the joint, so absolutely indispensable in assisting nature to establish a new joint, without the objection of disturbing the wound, which is apt to occur when the H-shaped incision is adopted.

In performing the operation by any of the methods advised, if the surgeon takes care to dissect all the structures between the olecranon process and internal condyle of the humerus, keeping the edge of the knife close to the bone, there is no danger of wounding the ulnar nerve, which, especially in a thickened condition of the soft parts, lies safely imbedded behind, and can be drawn *en masse* in front of the internal condyle, and thus escape injury.

Hemorrhage in this operation is not to be apprehended, but if the posterior ulnar recurrent artery, which is of considerable size, be wounded, or any other branch, it must be secured before closing the wound.

In sawing the bones, the humerus is to be cut first; if on section it is found to be soft, another portion should be removed. The section of the ulna ought, if possible, be made above the coronoid process to leave intact the brachialis anticus tendon; and, similarly, in removing the diseased portion of the radius, the tubercle must be left to preserve the insertion of the tendon of the biceps, and thus maintain the natural strength and movements of the joint.

In using the saw, its back ought to be directed to the brachialis anticus muscle (which forms the floor of the anti-cubital fossa) to protect the brachial artery. This vessel, however, is not likely to be endangered in a skilful operation.

A roughened state of the shaft of the humerus, sometimes observed when the joint is laid open for resection, is not indicative of caries, and must be distinguished from the thickened periosteum above referred to; such an appearance of the bone is likely to mislead inexperienced operators, and cause unnecessary removal of bone, or, perhaps, of the limb.

The infiltrated areolar tissue surrounding the joint ought to be

thoroughly removed by dissection to avoid the prolonged suppuration which would otherwise eventuate.

Passive motion of the elbow must be early adopted to insure mobility and assist nature in the formation of a new joint, as well as with a view of preventing ankylosis.

Part II.

WOUNDS OF ARTERIES IN THE VICINITY OF THE WRIST AND FOOT, ILLUSTRATED BY SIX CASES.

Wounds of the arteries in the vicinity of the wrist, palm of the hand, and sole of the foot, are of frequent occurrence, in consequence of the exposed position of the blood-vessels in those regions; the hemorrhage is often alarming, owing to the free anastomosis of the blood-vessels, and may threaten life if not arrested with promptitude. John Bell, in his able discourse on wounds of arteries near the wrist, says:—"If I do not mistake the importance of this accident, it is a sort of duty to explain it to you still further; for, though the operation of tying the radial or ulnar artery does not range in the catalogue of important operations along with the trepan and amputation, yet, if I be not deceived, it is more difficult than either, and certainly more frequently required."

Case I.—*Wound of the Left Radial Artery, half an inch above the Wrist-Joint—Ligature of the Vessel—Recovery.*

A. B., aged fifty-six years, a slater, was working on the roof of a stable, when a portion of the rotten wood-work gave way; he fell through the roof to the ground and was stunned. He was conveyed immediately to the City of Dublin Hospital. I saw him soon after his admission, and observed an incised wound running obliquely across the course of the left radial artery, about half an inch above the wrist-joint. The brachial artery was at once compressed, and the patient carried up to bed in the Accident Ward.

By proper treatment he soon recovered from the effects of the "stunning." The pressure having been taken off the main artery, the blood came *per saltum*, which proved that the radial artery was wounded. The wound having been dried with a sponge, I observed a slit in that vessel, nearly a quarter of an inch in length (evidently produced by a broken slate), and, in order to secure the artery above and below the wound, I found it necessary to open on a director, upwards and downwards, the fascia which covers that vessel. The artery was then detached, and a bent eye-probe passed

beneath it, armed with a double ligature; the probe having been withdrawn, and the loop divided, the two ligatures were separated, and the artery tied above and below the slit. The edges of the wound were approximated with strips of adhesive plaster, and a roller bandage was applied; the hand was placed upon a pillow. The ligatures came away in a week, and the man left the hospital in a few days, with the wound perfectly healed.

CASE II.— *Wound of the Plantar-Arch—Ligature of the Posterior Tibial Artery—Recovery.*

J. W., aged twenty-two years, a ship-carpenter, in dealing a blow on a piece of timber, the adze slipped, and struck him on the sole of the foot, cutting through his boot and inflicting a severe wound five inches in length. Bright blood flowed freely from the wound; his boot was removed, and a handkerchief was wrapped around his foot; he was conveyed at once to the City of Dublin Hospital.

On his admission the resident pupils made pressure on the femoral artery, in consequence of the alarming hemorrhage, and applied a compress of lint to the wound, and a roller bandage. I was immediately sent for, and having removed the compresses, which were stained with bright blood, I sponged out the wound, but could not see any bleeding vessel, as the cut was very deep. I plugged the wound with lint steeped in turpentine, over which I laid a compress, and placed a compress over the posterior tibial artery in the calcaneo-malleolar space, and another over the anterior tibial artery, and then applied a roller-bandage firmly from the toes. The limb was elevated. In a few seconds (the pressure having been relaxed off the femoral artery) the blood flowed freely from the wound. I therefore proceeded to tie the posterior tibial artery behind the inner ankle as follows:—A semi-lunar incision was made through the integuments, about two and a half inches in length, a thumb's breadth behind the internal malleolus; the three layers of fascia were divided on a director, and the artery, which was carefully separated from its accompanying veins, was ligatured by means of an aneurism needle. Pressure was then taken off the femoral artery, and not a drop of blood escaped from the wound, which was sponged out, and its edges gently approximated with strips of adhesive plaster; opium was prescribed.

The ligature separated on the fifth day; the wound in the sole of the foot healed up quickly, and the patient was discharged from hospital.

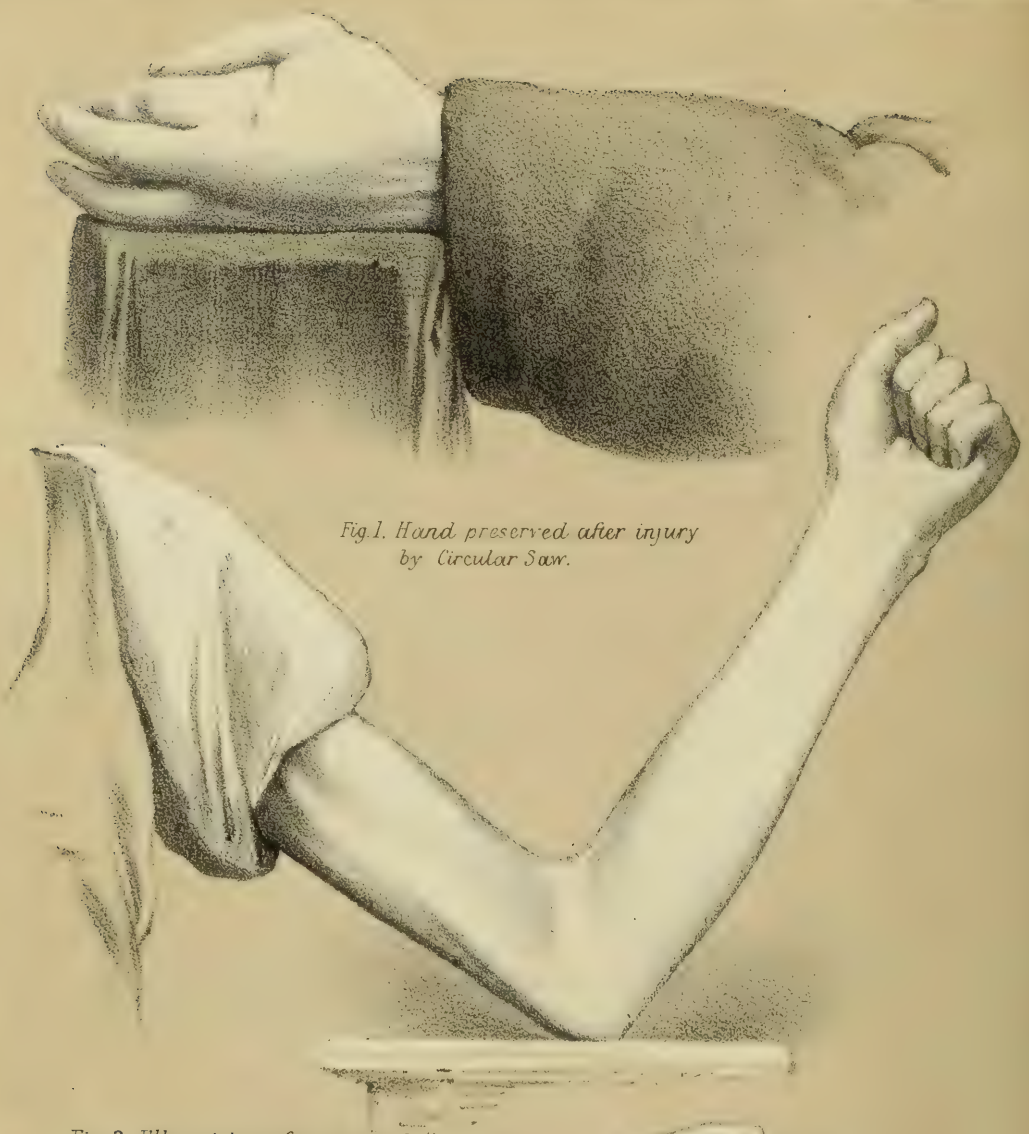


Fig. 1. Hand preserved after injury by Circular Saw.

Fig. 2. Elbow-joint after partial Resection.

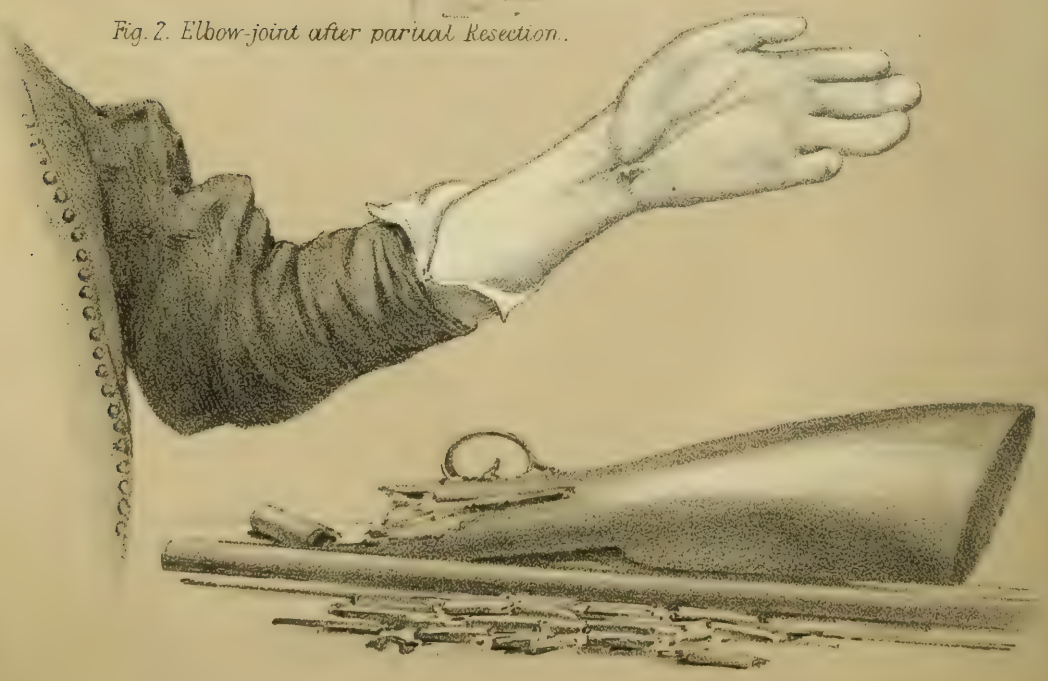


Fig. 3. Hand preserved after Gunshot.

Forster & Co Dublin

Case III.—*Wound of the Right Ulnar Artery and Nerve—Ligature of the Vessel—Recovery.*

J. P., aged seventeen years, was working on the roof of a house, helping a plumber. His foot slipped, and his leg went through the skylight. He put out his right hand to save himself from falling, and received a severe wound across the wrist from a broken pane of glass. The blood spouted with violence; a handkerchief was tied tightly around the wrist, and he was conveyed at once to the City of Dublin Hospital.

On admission pressure was applied to the brachial artery; and on examination I ascertained that the ulnar artery and nerve were completely divided. I secured the upper end of the artery in a forceps without difficulty; but the distal end retracted beneath the fascia; this I divided freely on a director, and I was thus enabled to secure the lower end of the vessel. The edges of the wound were brought together with iron-wire sutures, a compress of lint was applied, and a roller bandage. The patient was placed in bed, and an opiate administered. On the following day he complained of much pain in the little finger and half of the ring-finger. On the fifth day the ligature separated from the cardiac end of the artery; and on the eighth day from the distal extremity.

On the fourteenth day the patient was discharged from hospital, the wound having perfectly healed. He presented himself amongst the extern patients in a fortnight subsequently, and said that sensation had returned to the ring-finger, but not to the little finger.

Case IV.—*Gunshot Wound of the Palm of the Hand and Wrist—Severe Hemorrhage from the Palmar Arch—Ulnar Artery and Median Nerve Wounded—Vessels Ligatured in the Palm of the Hand—Ulnar Artery Acupressed—Recovery, with a Useful Hand.*

M. F., aged seventeen years, page to a gentleman residing a few miles from the city, was out shooting with a double-barrelled gun, which was loaded heavily with snipe shot; in firing the gun, the barrels burst, and inflicted a severe wound of the palm of the hand, wrist, and lower part of the forearm. The hemorrhage, which was profuse and arterial, was controlled temporarily by pressure applied to the brachial artery, and the patient was conveyed as quickly as possible to the hospital.

I saw him almost immediately after his admission, and found him in the following condition:—He was partially collapsed, and complained of intense pain.

Restoratives were administered, and on removing the dressings I observed an extensive lacerated wound extending from the junction of the lower with the middle third of the forearm to the centre of the palm of the hand. The muscles protruded, and several divided tendons were hanging loosely. The anterior annular ligament was completely severed, and the median nerve divided; the radial and ulnar arteries were exposed. I examined the wound carefully for the purpose of ascertaining if any wadding or portion of the gun had entered the hand, but could not discover either. The patient was now placed in bed, and a full opiate administered.

As soon as reaction became established, and pressure was taken off the brachial artery, several branches of the palmar arch bled. I secured each by means of the artery forceps, and applied a fine ligature. Having removed all the clots with a small sponge and stream of cold water, I proceeded to make careful pressure in the palm of the hand in the following manner:—

A small bit of lint which was steeped in a solution of perchloride of iron was fitted accurately into the bottom of the wound, from which there was a general oozing of bright arterial blood; and then a larger piece of lint was laid over the first, and so on until a graduated compress was formed; the palm of the hand was carefully padded with flat compresses to prevent blood being extravasated beneath the palmar aponeurosis. Before proceeding further I was obliged to amputate the ungual phalanx of the little finger, as that part was comminuted. I next applied the gauntlet bandage of Genga to each finger separately, and also to the thumb, and placed compresses on the back of the wrist to exercise pressure on the dorsal carpal arteries, as suggested and successfully practised by Mr. Adams, of this city. The fingers were placed on the palm, and fixed in that position with a view of relaxing the palmar fascia, which, if on the stretch, would tend to keep open the mouths of the vessels, and favour hemorrhage.

Having discovered a wound in the ulnar artery about two inches above the wrist, I secured it by passing an acupressure needle under it (carefully avoiding the ulnar nerve), and a loop of inelastic iron-wire over it; all hemorrhage was thus fully arrested. Oblong compresses were applied over the radial and ulnar arteries, and a roller bandage was evenly adjusted as far as the bend of the elbow. A roller was also placed transversely in the antecubital fossa, and the forearm was flexed on the arm; the battle-dore splint, properly padded, was applied to the hand and forearm to give sup-

port, and the limb was elevated. The anti-tetanic pills of the late Robert Moore Peile, of this city, were prescribed as follows:—

℞ Aloës hepaticæ.
Pulv. antimonialis ā ā gr. xij.
Opii. pulverizati, gr. iij.
Syrupi q. s.
Ut fiant pil. xij equales—duæ ter die sumendæ.

A full opiate was administered each night; the patient took ice, beef-tea, and wine. The acupressure needle was withdrawn on the third day, without any disturbance of the bandages. There was no return of the hemorrhage, and the wound healed gradually. The tip of each of the first three fingers was destroyed by gangrene, which fortunately did not spread. The boy remained nearly three months in hospital, and was then discharged. He has resumed his occupation as page; can attend table, and make good use of his hand.

A photograph of the patient was taken by Lawrence, showing the hand and gun, and the accompanying lithograph by Herr Tomsohn.—(*Vide* Plate II., Fig. 3.)

Case V.—*Compound Comminuted Fracture of the Metacarpal Bones of the Left Thumb and Index Finger, with Wound of the Radial Artery, caused by a Circular Saw—Hemorrhage arrested by Acupressure—Wound Dressed with Carbolic Acid—Recovery, with a Useful Hand.*

E. D., aged seventy years, a boatman, incautiously put his hand under a circular saw to pull out shavings. The saw caught his hand, and almost completely severed his thumb and forefinger. He was conveyed at once to the City of Dublin Hospital, and I saw him immediately on admission (as I happened to be in attendance on the engine-driver and stoker who were injured by the serious accident at Bray Head on the same morning). On examination I observed the thumb and index finger lying in the palm of the hand, held in front merely by the flexor tendons and integument. A fearful wound presented itself, extending from the groove which separates the ball of the thumb from the palm to the dorsal surface of the second metacarpal bone. Arterial blood flowed freely, when pressure was taken off the brachial artery, which an assistant had charge of. I sponged out the wound, and tied several small muscular branches of the radial artery. The main vessel was

wounded in the deep space between the metacarpal bones of the thumb and index finger, where it dips in to form the deep palmar arch, and was secured by passing a long, slightly-curved acupressure pin beneath it, and a loop of inelastic iron-wire over it, being an example of the fourth method of acupressure.

The hemorrhage was thus fully controlled, and I next proceeded to examine the fractured metacarpal bones. That of the thumb was broken obliquely in two places near its centre. I placed the fractured portions in apposition, and having made a suitable gutta percha splint, I applied it to the under surface of the thumb, so as to give it steady support. The metacarpal bone of the index finger was also comminuted, and I was obliged to remove one loose piece. The index finger was strapped to the second finger; the hand was then fixed on a well-padded battle-dore splint. Carbolic acid oil and ointment were applied to the wound. The anti-tetanic pills were prescribed, and a liberal allowance of beef-tea, wine, and ice. The acupressure pin was removed in twenty-four hours, and the wound again dressed with carbolic acid ointment. The case progressed most favourably, and the patient was discharged from hospital in six weeks, and attended as an extern patient to have his hand dressed; he is able to oppose the thumb and forefinger, and has a useful hand. The accompanying lithograph (taken from a photograph) shows the present condition of the hand.—(*Vide* Plate II., Fig. 1.)

CASE VI.—*Gunshot Wound of the Thumb—Amputation performed at the Metacarpo-Phalangeal Articulation—Hemorrhage arrested by Acupressure—Stump Dressed with Carbolic Acid Ointment—Recovery.*

C. H., aged twenty-five years, groom to a nobleman near the city, was out shooting. He placed his thumb on the top of one of the barrels of the gun; the breech was on the ground. From some unknown cause the gun went off, the shot carrying away the ungual phalanx of the right thumb. The patient lost a considerable quantity of blood, and was brought to the hospital as soon as possible.

I visited promptly on receiving the accident-notice, and found him partially collapsed. On examination the ungual phalanx of the thumb was seen hanging loosely. The bone of the proximal phalanx was shot away, and a portion of jagged integument connected the distal phalanx with the hand. With a small scalpel I removed the thumb, and made flaps sufficiently large to cover the

end of the metacarpal bone. The vessels were acupressed, and the wound was dressed with carbolic acid. The anti-tetanic pills were prescribed. The patient suffered much pain in the thumb and up the arm for several days. The wound healed gradually, and he was discharged from hospital. He is able to drive and groom a horse, and has very good use of his hand.

The treatment and successful result of the foregoing cases will justify the following practical remarks on this important department of surgery:—When the radial or ulnar artery is wounded near the wrist, the proper treatment to be adopted is to tie the bleeding ends, or to arrest the hemorrhage by acupressure or torsion. If necessary the wound should be previously enlarged along the course of the vessel, and the fascia which covers it must be also freely divided on a director, as the wounded artery is very liable in this region to retract under the fascia. The highest surgical authorities advocate the ligature in preference to any other mode of treatment. John Bell in his Surgery says:—"The radial artery is one of that order and size which cannot be restrained but by the ligature;" and also adds, "There is no safety in trusting to compression, sponges, or astringents, for you are yourselves never free from anxiety, nor your patients from danger. The blood bursts out again and again, and all those intervals of expectation and those apparent successes only increase the difficulties of the case. To temporize is cruelty, not mercy." Cases are also recorded in Bell's Surgery in which loss of limb and even of life itself resulted from trusting to pressure instead of the ligature. The following interesting and instructive case occurred in the practice of our celebrated countryman O'Halloran:—

"A butler to a gentleman in wiping a glass happened to break it, and received a considerable wound of the wrist, in which the radial artery was divided. It bled violently, and with some difficulty was mastered by Mr. White. The bleeding returned in two days, again in five, and thus continued bursting forth at times, on the least motion of the hand, for near a month. This great loss of blood having greatly fatigued and weakened the patient, on a consultation with the late Mr. Gould, amputation of the arm was resolved upon, and performed on the very next return by Mr. White, in the presence of Dr. Martin, and the man soon recovered, but was rendered incapable of service."

If pressure be resorted to in wounds of the radial or ulnar arter

near the wrist instead of securing the ends of the vessel, hemorrhage is liable to occur again and again, and the blood becomes extravasated beneath the fascia into the surrounding areolar tissue, which becomes altered into a placenta-like mass, or like rotten sponge. Inflammation and sloughing result; the artery becomes diseased from repeated attacks of inflammation, and if then sought at the wounded part (a most difficult undertaking), the ends of the vessel which have retracted are in so altered a condition that they will not hold the ligatures, and I feel justified in adding that the successful termination of my cases, as above detailed, was entirely owing to the prompt application of the ligature or acupressure needle, and not by trusting to other resources.

In wounds of the palmar arch if a bleeding vessel can be seen it should be secured; if not, the wound may be cautiously enlarged with the aid of a director, curved near its point, to enable the operator to reach the vessel without injury to any of the other important structures in that region. The practice here differs from that required in a wounded radial or ulnar artery, as pressure when carefully applied in the palm of the hand is often sufficient to arrest the most troublesome bleeding, and should be done in the manner fully detailed in Case IV. If pressure fails, the surgeon must lose no time in adopting the practice first recommended by Liston, viz.: to secure the brachial artery. In wounds of the plantar arteries the treatment which I adopted in Case II., namely, ligature of the posterior tibial artery behind the internal malleolus, is the only practice to be relied on. In wounded arteries, generally, the great rule established by Guthrie and other surgical authorities is to secure the vessel above and below the bleeding point. The following cases, illustrative of the success of this practice, were annually related by the late Dr. Woodroffe in his surgical lectures in the Cork School of Surgery (of which he was the founder), and I am indebted to my father, who was apprentice for five years to that distinguished surgeon, for the notes of the cases. "The Hon. Mr. Deane (subsequently Lord Muskerry) was bled from the arm, and the brachial artery was wounded. Notwithstanding pressure having been applied, the bleeding occurred again and again, and his life being endangered, he was brought to Cork from the county of Limerick, and on a consultation of many surgeons amputation was recommended. Dr. Woodroffe having got permission to try and secure the bleeding ends of the artery, he accomplished the operation expertly, and the nobleman recovered with the full use

of the limb, and the case added greatly to the deserved reputation of that eminent surgeon."

The second case occurred at Spike Island, and is already recorded by Mr. Butcher. "A man wounded the posterior tibial artery as it passes behind and above the inner ankle. Dr. Woodroffe was called in to justify amputation, and, as in the preceding case, succeeded in tying the wounded artery above and below the bleeding parts. This was the means of saving the man's limb, and probably his life."

Tetanus is a well-known and dreaded complication in gunshot or lacerated wounds of the hand and foot (as in Cases III. and VI.) Fortunately none of my patients were attacked by so fatal a complication. The early use of the anti-tetanic pills was probably a preventive in those cases.

Part III.

REMARKABLE AND CURIOUS CASE OF FOREIGN BODY IN THE LARYNX—SEVEN ARTIFICIAL TEETH (SET IN GUTTA-PERCHA) HAVING ENTERED THE WINDPIPE DURING A FIT OF EPILEPSY—IMPENDING SUFFOCATION — TRACHEOTOMY PERFORMED — FOREIGN BODY EXTRACTED — DEATH THE RESULT OF A VIOLENT EPILEPTIC SEIZURE.

At eleven o'clock on the night of the 9th of July of the present year I received an urgent message from Mr. Lyon, of Patrick-street (general medical practitioner), requesting me to visit Mr. ———, a *Dentist*, aged thirty years, residing in Parliament-street, who had missed a set of artificial teeth from his own mouth on recovering from an epileptic fit in the afternoon of that day, and who was then suffering from urgent dyspnea.

Having placed in my pocket the instruments and appliances required for tracheotomy, I drove at once to the residence of the patient and found him sitting up in bed suffering from croupy breathing. In reply to my questions he spoke in a whisper. I ascertained on inquiry from his wife the following facts:—Her husband had been the subject of severe epilepsy for sixteen years. He lost his teeth early in life, and before his marriage had an artificial set put in, which she was in the habit of removing when he was seized with a fit. The clasp of the upper set was broken, and through negligence had not been repaired. He was frequently attacked with epilepsy when in the act of operating as a dentist. He dined heartily

at four o'clock on that day, and at five o'clock had a violent fit; and on recovering could not find the upper set of teeth belonging to the front of his mouth. He felt uneasiness in his throat; lost his voice, and had some difficulty of breathing. He searched his bed and room for the teeth but could not find them, and yet he could not believe that he had swallowed them. His wife sent for Mr. Lyon shortly after the occurrence, who, finding the patient's symptoms becoming serious, requested that I should be sent for. I proceeded to examine the patient in the following manner. I first passed the fore-finger down to the entrance of the windpipe to ascertain if the foreign body lay across the opening. I then examined his chest carefully with the stethoscope, but could not discover any alteration from the natural respiratory murmur. I next drew forward the tongue and introduced a long curved forceps into the larynx; this produced alarming dyspnea; the patient vomited large lumps of meat and potatoes. I informed the patient and his wife that I believed the teeth were lodged in the windpipe, and that an opening should be made without delay into the air-tube to prevent suffocation. I also stated that if he got an epileptic fit while the foreign body lay in the windpipe he might be suffocated.

I had the advantage of a consultation with my able friend Mr. Porter, now President of the Royal College of Surgeons. He agreed with me as to the imperative need for immediate operative interference. In his presence I again attempted to feel the foreign body with the aid of a long curved forceps, but was obliged to desist in consequence of the urgent dyspnea and struggling of the patient. The necessity for the operation was fully explained to the patient and his wife. They agreed to our proposal, and I then proceeded to operate. The patient was placed on his back on a table as near as possible to a jet of gas which was over the mantel-piece. His shoulders were raised, but he suffered considerable dyspnea when his head was brought backwards. His beard having been shortened, and the integument over the trachea steadily fixed, I made an incision in the median line with a scalpel, commencing about half an inch above the sternum, and extending nearly as high as the cricoid-cartilage. The fascia connecting the sterno-hyoid and sterno-thyroid muscles was divided on a director, and then with the handle of the knife and the end of my forefinger I quickly reached the tracheal fascia, which I scraped through with a director. Scarcely a drop of blood was lost. Enormous veins (the inferior

thyroids), almost as large as goose-quills, were seen lying parallel to the trachea; these, with the sterno-hyoid and thyroid muscles, were carefully retracted by Mr. Porter. Having laid bare the rings of the trachea, which was very deep and small, I seized and raised the tube by means of a small hook, and with a narrow-bladed knife I cut a circular piece out of the trachea as large as a sixpence. The dyspnea was relieved, and the air passed through the wound with a loud hissing sound. The windows were thrown widely open, and the patient sat up. I proceeded to search through the wound alternately with my finger, a bent probe, and a curved forceps in every direction, but could not touch the foreign body. This proceeding caused urgent dyspnea. Soon after the patient was seized with one of the worst epileptic fits which I ever witnessed. His face became almost black, and his features were hideously distorted. The air passed freely through the artificial opening during the fit, as evidenced by holding a lighted candle to the wound. The flame was blown out three times in succession. We dashed his face with cold water, and I raised with a hook the opening in the trachea, and kept it raised on a level with the wound. The mucus was carefully removed with a small sponge and feathers. The fit lasted about a quarter of an hour, and we feared that he would have expired in it. He recovered, and I again attempted to find the foreign body. On introducing the end of the little finger I touched a hard substance lying at the left side of the larynx, close above the wound. I tried to seize it in a polypus forceps, but it slipped upwards towards the mouth. I then caught and was enabled to remove the set of artificial teeth. They are represented in the accompanying lithograph. The patient was shortly afterwards seized with another epileptic fit, in which he soon expired.—(*Vide* Plate I., Fig. 4.)

The annals of Surgery afford numerous instances in which foreign bodies of various forms and size have accidentally entered the air-passages—amongst the most remarkable of which are the case of Brunel, the celebrated engineer, in whose larynx a half-sovereign slipped, and which, by a combination of artistic and scientific skill, was happily expelled thirty days after the accident—tracheotomy having been performed by Sir Benjamin Brodie; Houston's case, in which a large molar-tooth entered and passed through the larynx during the operation of extraction; also cases of, buttons, pease, fruit-stones, portions of bone, &c.; but perhaps the case now related has no parallel, in which so large a foreign body as seven

teeth, set in vulcanite, entered the larynx, and passed through the rima glottidis, and lodged at the junction of the larynx and trachea.

That a foreign body had entered the air-passage during a fit of epilepsy was evident in this case, from the croupy breathing, urgent dyspnea and aphonia, corroborated by the fact that the artificial teeth belonging to the upper jaw were missed by the patient after the epileptic seizure, and could not be found. The stethoscopic signs were negative, in consequence of a foreign body having been fixed in the long axis of the trachea (as was afterwards ascertained in the removal of the teeth), and thereby not fully obstructing the entry of air into the lungs.

The necessity for bronchotomy was obvious, and was sanctioned on consultation with Mr. Porter. The danger of spasm of the glottis in this case was imminent and two-fold, either from the foreign body being forcibly driven against the rima glottidis during respiratory efforts or during a return of the epileptic seizure. I accordingly performed the operation of tracheotomy, ably assisted by Mr. Porter.

Such a procedure at mid-night on an epileptic patient, having a fat neck, with enormous large veins and a small and deeply-seated trachea, was a serious undertaking, and, so far as the operation itself was concerned, was perfectly successful. Death was obviously caused by prolonged and violent recurring epilepsy.

ART. VIII.—*The Instantaneous Method of Treating Stricture of the Urethra.—The Perrève-handled and Tunnel-handled Dovetail Stricture Dilators, together with the Dovetail Urethrotome Conductor and Single-bladed Dilator.* By B. WILLS RICHARDSON, F.R.C.S.I., Examiner in the Royal College of Surgeons, and Surgeon to the Adelaide Hospital, Dublin.

IN the *Medical Press and Circular* for April and November, 1867, March, 1868, and in *British Medical Journal* for February of same year, I published illustrated descriptions of some stricture dilators, which, although different in construction, are identical in principle, the forcers of each being formed so as to dovetail with the lower blade. I am indebted to the Messrs. Oldham, of Dublin, the eminent engravers, for the idea of applying the dovetail principle to the dilator. The first design was—to form the conductor like the male part of an ordinary dovetail joint, and attach it by the apex



Fig. 1.—The writer's modification of the original dovetail dilator.

to the centre of the upper surface of the lower blade, extending from the posterior end of the handle to about an inch of the point. And—that the forcer should be hollowed, having a slit along its under part for the passage or free sliding of the neck of the conductor.

It is unnecessary to delay the reader with any further description of that design, as I am informed a dilator cannot be constructed of small calibre according to it, and at the same time have the strength which should be possessed by an instrument for the instantaneous method of forcing urethral strictures. Fig. 1 represents a dilator constructed upon the above-mentioned plan, but with some modifications of mine in the handle and conductor, the latter being round and not triangular as originally proposed.

If the reader will study Figs. 2 and 3 he can scarcely fail to understand the difference between the original design and that of Fig. 1.

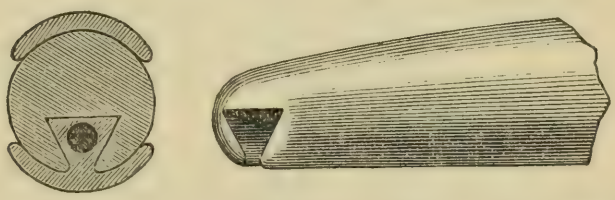


Fig. 2.—Diagrammatic vertical section of the dovetail conductor, forcer, and blades, with separate piece of forcer, of the original dovetail dilator.

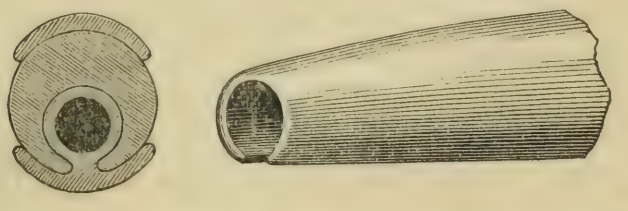


Fig. 3.—Diagrammatic vertical section of the dovetail conductor, forcer, and blades, with separate piece of forcer, of the author's modification of the original dovetail dilator.

Although the dilator delineated in Fig. 1 cannot be made of the required fineness and strength, the design, nevertheless, was the first step in enabling me to perfect a dilator, the tunnel-handled instrument, which, judging by the favourable testimony I have received regarding it, and my own experience of its action, I am induced to consider one of the safest instruments in use, for the instantaneous method of overcoming a stricture of the urethra.

When the positions of the component parts of the dovetail, seen in Fig. 1, are mutually transposed, then a dovetail dilator can be made of the necessary fineness, strength, and solidity. An instrument constructed conformable to this plan, was made for me by the Messrs. Weiss, and first described in one of the November numbers of the *Medical Press and Circular* already alluded to. This dilator is wonderfully strong, and of very small calibre for an instrument of the kind, being only No. 2 at the point, thence gradually rises to No. 3, and finally to No. 4 (Weiss' gauge), which it retains to the handle.

Description of the Perrève-handled Dovetail Dilator.

The Dilator (Fig. 4), like Perrève's Fig. H. model[a] (Fig. 5), is composed of two blades soldered together at their vesical ends. Instead, however, of having an oscillating conducting rod, this form of conductor has been dispensed with; and, therefore, when the instrument is in use, it is composed of, viz.:—

(1). The two blades, with their corresponding half-handles.

(2). The two clamps, fixed by screws to the lower half-handle.

(3). The forcer.

The lower blade differs very much from the corresponding blade of the Perrève dilator, which is but slightly grooved for the play of a small portion of the circumference of its conical forcer.

In the dovetail dilator, the lower blade forms the greater portion of a cylinder, and would be complete only for an interspace (Fig. 6) along its upper part, for the passage of the neck of the male dovetail attached to the forcer. Fig. 7 is a diagrammatic section of the forcer and two blades, and shows the relations these parts should bear to each other. The upper blade is slightly grooved to fit the upper margin of the forcer (Figs. 6 and 7).

[a] Traité des Rétrécissements de l'urètre. Emploi Méthodique des Dilateurs Mécaniques dans le Traitement de ces Maladies. Par Victor Perrève. A Paris, 1847. Pl. 3.



Fig. 4.—Dovetail dilator with forcer between the blades. The posterior clamp is not so deep as the corresponding clamp of Perrève's dilator. Perrève used the deep clamp as a point of resistance for his fingers in his method of pushing the forcer home.

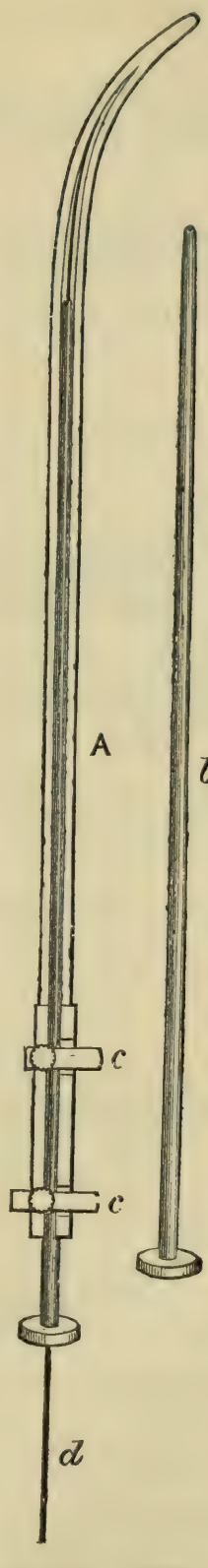


Fig. 5.—A. Perrève's Fig. H Dilator. *c c*—Clamps. *d*—Long conducting rod. *b*—Separate forcer.

In this dilator, as I mentioned in November, 1867, the posterior

part of each blade is soldered in a central groove channelled the whole length of its own half-handle (Fig. 8).

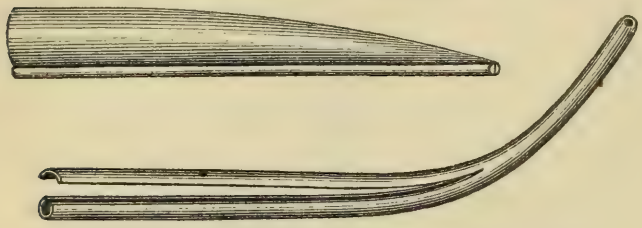


Fig. 6.—Vesicle end of dovetail dilator and of forcer.

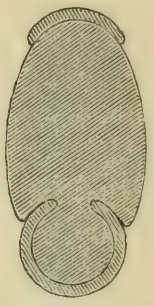


Fig. 7.—Diagrammatic vertical section of forcer and two blades. Shows the dovetailing of forcer with lower blade.

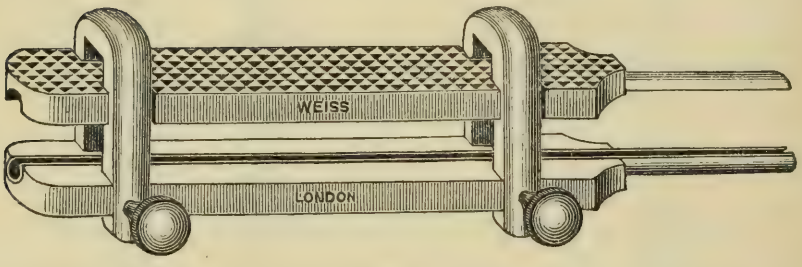


Fig. 8.—Clamped handle of dovetail dilator. The screws are fitted to the right vertical clamp bars, as seen in Fig. 16, copied from Perrève's work. In all his other drawings he represents them in the left vertical bars.

The half-handles are nearly identical with the half-handles of the Perrève instrument (Fig 9). I had them applied to Fig. 8, feeling

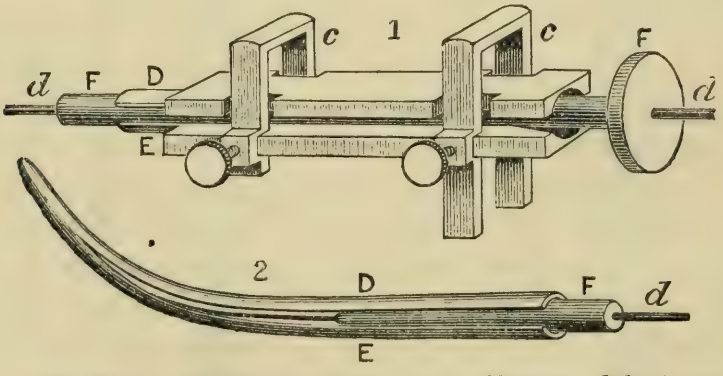


Fig. 9.—1. Handle of Perrève's dilator. *c c*—Clamps. *d d*—Conducting rod. D E—Portions of the blades. F F—Forcer on rod.

2. Vesicle end of Perrève's Fig. H dilator. D E—Blades soldered together at their vesicle ends with *d*, the conducting rod. F—The forcer. Perrève used the same description of handle with all the dilators illustrated in his work.—(*Ibid.*)

that, as they are suitable for the working of Perrève's dilator,

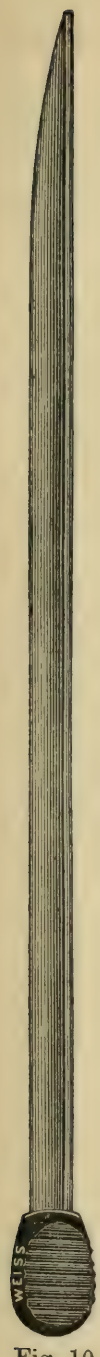


Fig. 10. Dovetail forcer.

they would likewise form a good handle for the dovetail dilator. Further on it will be seen that I have, since the description of Fig. 4 was published, designed a handle better adapted for instantaneous dilatation with the dovetail dilator than the Perrève handle.

The soldered vesicle end of the dilator is traversed by a canal (Figs. 4 and 6), continuous with the grooves in the two blades, which, when grasped by a stricture, form a sufficiently perfect passage for the urine, and thereby enable the surgeon to know when the bladder has been entered.

The Forcer.—The forcer (Fig. 10) may be made of hollow tubing or of solid metal. The latter is preferable. Its shape may be varied, as seen in Fig. 11. I myself prefer the broad forcer, having found the stricture yield at once to its iufluence, and it is so perfectly secured against any tendency to lateral tilting, by resting upon and partially grasping the lower blade, at each side of the longitudinal slit (Figs. 7 and 11).



Fig. 11.—Vertical sections of forcers, suitable for the double-bladed dovetail dilator. Flat-sided forcers should be deeper vertically than broad ones. The two narrow forcers in the figure are not represented of the proper relative depth.

The flat-sided forcer should have a greater relative vertical depth than the broad one, or it will not produce an amount of dilatation equal to the latter. The groove of the upper blade must be very accurately adapted to, and slightly overlap the upper edge of the flat-sided forcer, as an additional security against lateral tilting. The two sections of narrow forcers in Fig. 11, have not been drawn deep enough to show the proportion they should bear to the broad ones in same figure.

The forcer is not to rise abruptly to its full diameter. The curve of Fig. 12 will, I have no doubt, appear to many of my

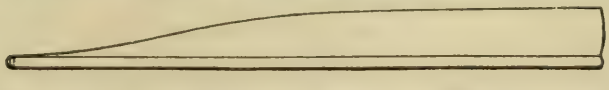


Fig. 12.—Vesical end of dovetail forcer, having a different curve superiorly than seen in Figs. 4, 6, and 10. A forcer of this curve scarcely permits of any appreciable space to be formed between its vesicle end and the blades, when it is gliding between them.

readers better adapted for separating the blades than the curve given to my first forcers (Figs. 6 and 10).

The male dovetail is formed along the lower part of the forcer, and should extend from point to handle (Figs. 10 and 11); and be shaped and sized to correspond to the groove and slit of the lower blade, merely allowing of its gliding with facility when the forcer is being pushed home (Fig. 7).

The number of forcers to be supplied with this dilator, and the one I am about to describe, depends upon the requirements of the surgeon. So many, clearly, are not necessary for instantaneous enlargement to full calibre of canal, as for the slower mode of procedure.

I need scarcely say that the forcers and blades should be highly polished.

It appears to me advisable, before describing the tunnel-handled dilator, that I should draw the reader's attention to the mechanical working of Perrève's handle, when forming part of his instrument.

The handle was designed by Perrève, with the chief object of preventing the rod from wriggling, when it is conducting the forcer between the blades. The tendency to wriggle may, to a great extent, be obviated by the combined influence of the clamps (Fig. 13),

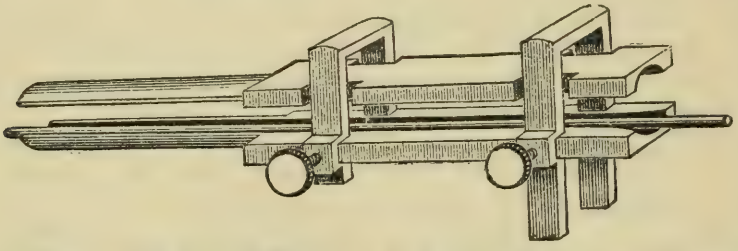


Fig. 13.—Clamped handle of Perrève's dilator, with portion of conducting rod between its two halves. A little of each blade is also seen.

half-handle grooves, and finger-pressure of the surgeon, provided it is sufficiently firm to prevent the forcer and rod from slipping

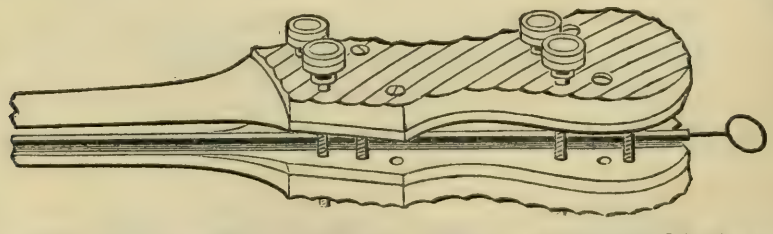


Fig. 14.—Mr. Holt's handle for the Perrève dilator, as represented in the second and last edition of the former's memoir on the immediate treatment of stricture of the urethra. In this handle steady pins are used, instead of Perrève's steady clamps, for maintaining the half-handles in proper relation to each other.

out of the grooves. If the half-handles are not energetically pressed towards each other when the forcer is in the grooves, there will be great risk of the conducting rod buckling, particularly when the forcer is being pushed quickly home. Pressure, however, of the Perrève half-handles and their modifications (Fig. 14), is a

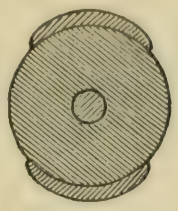


Fig. 15.—Diagrammatic vertical section of conducting rod, forcer, and blades of dilators on the Perrève principle. Shows the risk of the forcer slipping from between the blades, if the conducting rod deviates from its central position. Compare with Fig. 7.

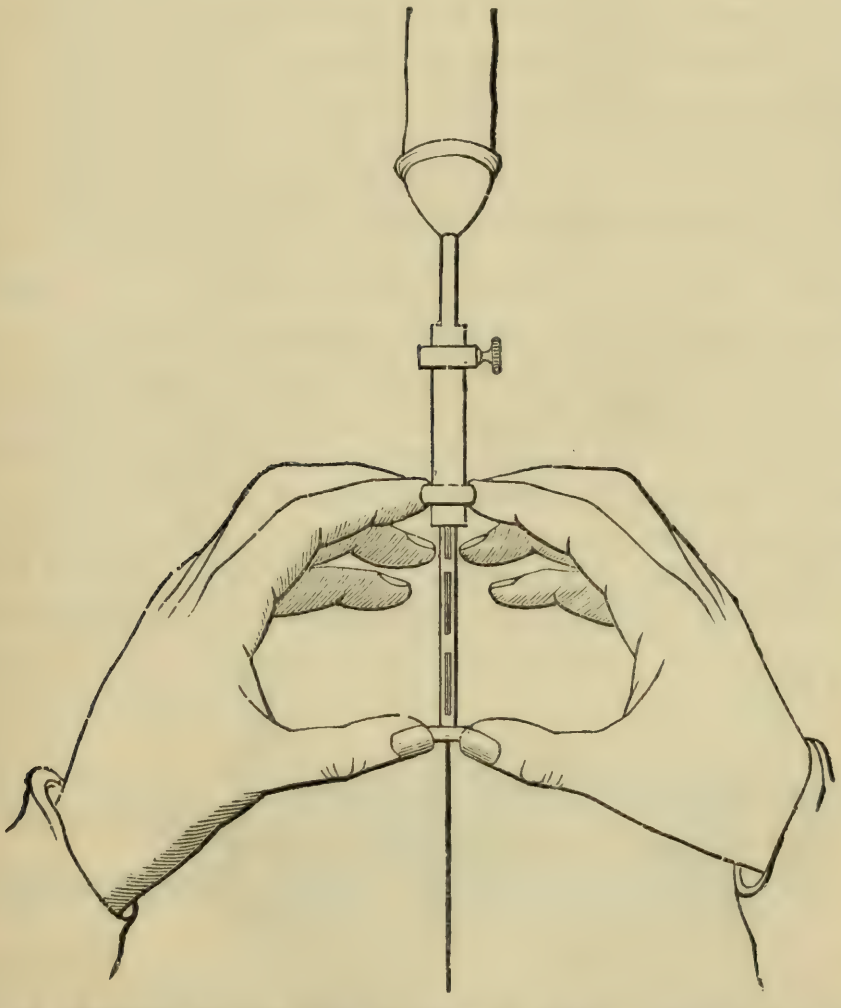


Fig. 16.—Perrève's ordinary mode of using the dilator. Copied from p. 173 of his work.

great obstacle to rapid gliding of the forcer, and, the greater the stricture resistance, the greater the pressure required to maintain the rod and forcer in a central position between the blades.

Fig. 15 will assist those readers not familiar with dilators constructed on the Perrève principle, in understanding why the rod is in danger of buckling, if allowed to deviate from its central position when the forcer is passing along it. Of course the chances of the rod bending or buckling, are not so great when the forcer is used according to the slow method Perrève so frequently followed (Fig. 16); but, if it is driven home with great rapidity, then, indeed, the half-handles must be steadily pressed towards each other, or the consequences may be most disastrous.

After numerous trials of the Perrève-handled dovetail dilator, I satisfied myself that the forcer is so securely retained in a central position between the blades, from dovetailing with the lower one, that, as far as safety is concerned, firm pressure of the half-handles is altogether unnecessary, and therefore we might get rid of a great drawback to its swiftly sliding. Indeed, the dovetail dilator may be securely worked, without any pressure of the forcer, when it is passing through the handle. This was a most important point to have ascertained, and enabled me to substitute for the Perrève handle, one which allows the forcer to act against the stricture, almost, if not altogether, instantaneously.

Albeit, pressure of the forcer through the intermedium of the handle is unneeded; it appeared to me that a handle, in which screw pressure could be applied to the part of the upper blade which plays in it, might be advantageous, by allowing the blades to be pressed together during the passing of the dilator. With this intention I designed a tunnelled handle, which permits of pressure of the handle portion of the upper blade being applied to a nicety

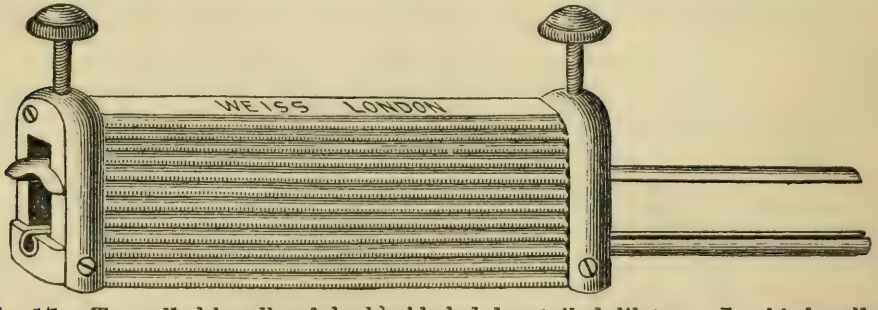


Fig. 17.—Tunnelled handle of double-bladed dovetailed dilator. In this handle the upper blade is prevented going forward with the forcer by being somewhat T shaped posteriorly, whereas in the Perrève handle the same result is obtained by the playing of the clamps in the notches of its upper half.

by means of two screws. This handle (Fig. 17), does not allow of any finger pressure of the forcer by means of the upper blade (Fig. 18), which should be so proportioned to the inside of the tunnel to

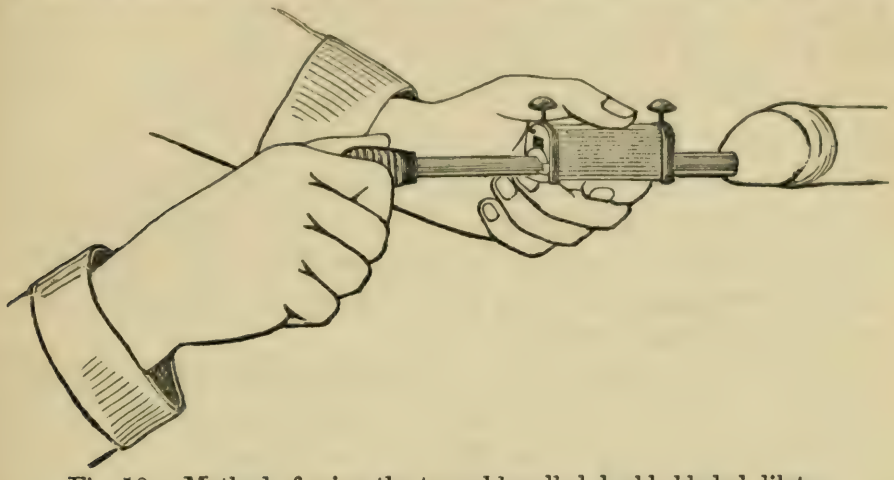


Fig. 18.—Method of using the tunnel-handled double-bladed dilator.

allow of free, but not too free, vertical play (Fig. 19). Being T shaped posteriorly it is prevented going forward with the forcer, by



Fig. 19.—Part of upper blade which plays inside handle, with part of blade anterior to handle.

the playing of the arms of the T against the corresponding uprights of the arch of the tunnel.

The posterior end of the lower blade is soldered in a groove formed for it the whole length of the tunnel.

The tunnelled handle made for me by the Messrs. Weiss, is wrought in steel and silver, the ends and floor of the arch being formed of the first material, the remainder of the latter; but silver is not essential for its construction.

The aperture for the urine to enter the dilator may be made to run through its point as in Fig. 4, or to open on the convexity of the curve.

When the beak of the dilator is bulbed (Fig. 20), its introduction

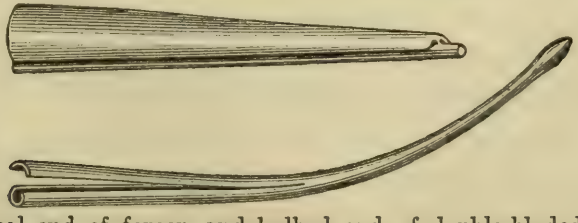


Fig. 20.—Vesical end of forcer, and bulbed end, of double-bladed dovetail dilator. The opening for the urine is not seen in the figure.

is greatly facilitated, particularly when there is more than one stricture. The curve should not be too abrupt; in fact, the dilator ought to be nearly straight.

In my description of the tunnel-handled dilator, in March last, I stated that its bulbed end could be fitted with either a long or short movable gum-elastic guide, by means of a screw arrangement, the bulb being hollowed for the reception of the male screw, attached to the guide. One of Perrève's drawings represents a somewhat similar arrangement. I have since then found, that a modification in the mode of using Desault's guide, catgut being substituted for metal, answers all the purposes of the above more expensive gum-elastic one.

If a piece of prepared catgut, of suitable size, and three or four inches longer than the dilator, be passed through the dovetailed canal of the lower blade, until it projects about an inch from the beak, it will form a very useful guide in difficult cases (Fig. 21).



Fig. 21.—Vesical end of dilator with catgut guide projecting from the bulbed point. It may be remembered, that Dr. Hutton was in the habit of sliding the catheter into the bladder over his catgut guide previously introduced into that viscus, whereas, according to the plan suggested in the text, the guide and dilator are both passed together.

It is almost superfluous to observe, that the opening for the urine must be in the point of the dilator, to enable the surgeon to avail himself of such assistance, and that the catgut is to be withdrawn when the bladder has been entered.

Forcers similar in form may be used with both the Perrève-handled and tunnel-handled (Fig. 22) double-bladed dilators, but I prefer the broad forcer, also, for the latter dilator.

The Perrève-handled and tunnel-handled dovetailed dilators are both made by the Messrs. Weiss, and are kept in stock by Fannin & Co., the Messrs. Weiss' agents in Dublin. The tunnel-handled

instrument, however, is so complete in every respect, it is the one I recommend.

The Dovetail Urethrotome Conductor and Single-bladed Dilator.—A conductor, similar in principle to the lower blade of the double-bladed dovetail dilator, makes an excellent and safe director for the urethrotome, the latter being adapted to the single blade (Fig. 23), by the aid of a male dovetail.

If the urethrotome sheath and conductor are properly fitted to each other, the groove of the latter will pilot the urethrotome to a stricture with precision and safety. The dovetail conductor is, therefore, free from the risk incidental to the use of many of the instruments designed for cutting strictures from before backwards. The conductor made for me by the Messrs. Weiss has a tunnel handle (Fig. 23), and is of small size, being only 1½–2, and 3 (Weiss' gauge), from point to handle. But, if the point is made bulbous (Fig. 24), this part will be more than 1½ of same gauge. The conductor, in the same manner as the double-bladed dilator, can be furnished with either the gum elastic or the catgut guides, for pioneering the blade in difficult coarctations.

There is attached to the lower edge of the urethrotome sheath, a male dovetail, adapted for gliding along the groove of the conductor. It is of sufficient size to prevent it from rising out of the groove (Figs. 25, 26, 27).

The lower edge of the cutting blade is likewise dovetailed (Figs. 25 and 26), so that, when sheathed, its dovetail appears to be continuous with that of the sheath (Fig. 27). By dovetailing the knife with the conductor, it is maintained in a perfectly central position when dividing a stricture.

In the posterior steel arch of the handle of the conductor there is a screw (Figs. 23 and 24), for rendering the sheath immovable as the blade goes forward.

In order to ascertain if the stricture has been completely divided, the knife is to be retracted within its sheath, the handle screw reversed for a few turns, and the sheath is then to be pushed forward, towards the bladder.

The dovetail conductor can be used as a dilator, but is not suited for such rapid action as the double-bladed dilator, when the stricture will only allow a No. 4 bougie to pass it. But if more dilated, say to No. 6 or 7 (Weiss' gauge), the forcer may then be driven quickly home.



Fig. 22.—Double-bladed tunnel-handled dilator, with forcer between the blades.

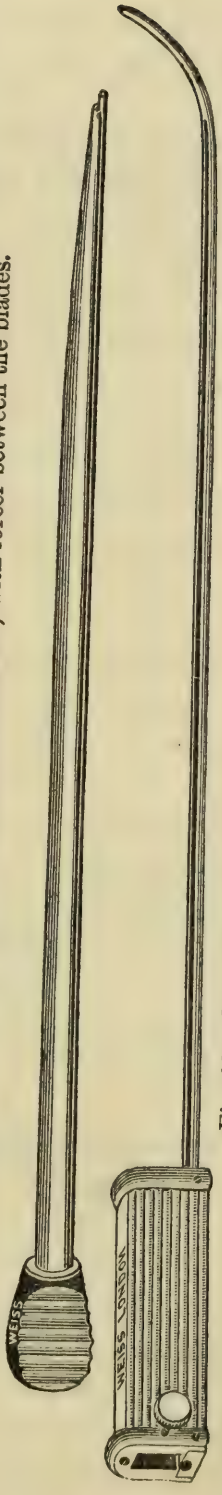


Fig. 23.—Tunnel-handled single-bladed dilator and urethrotome conductor.

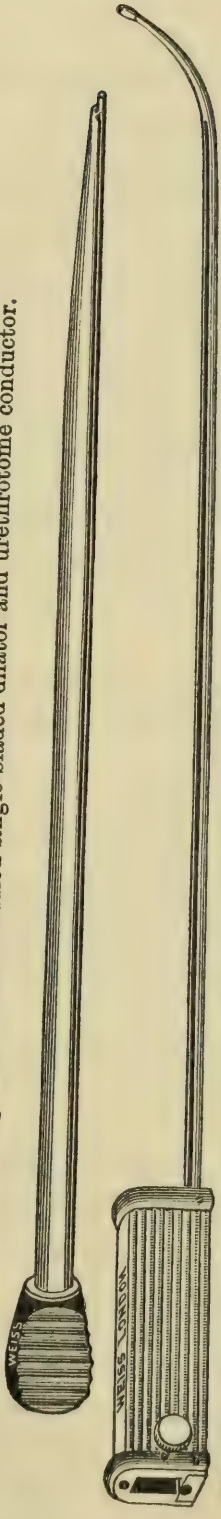


Fig. 24.—Bulbed tunnel-handled single-bladed dilator and urethrotome conductor. The forcer is represented a little too long.

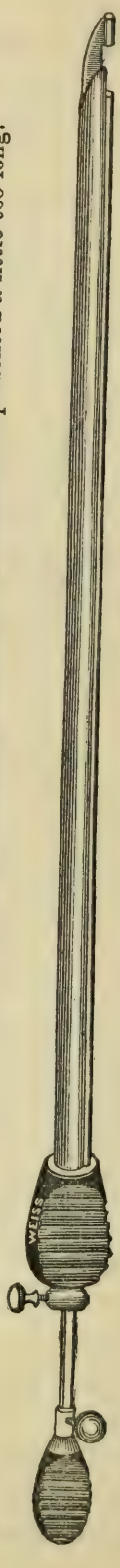


Fig. 25.—Dovetailed urethrotome sheath and blade.

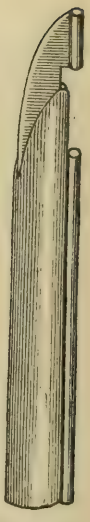


Fig. 26.
Urethrotome
protruded.

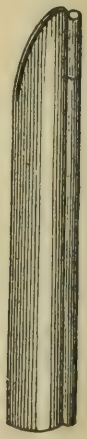


Fig. 27.
Urethrotome
sheathed.

A few weeks ago, having dilated with bougies to No. 6, an obstinate stricture of the anterior part of the urethra of J. S——, a patient in the Adelaide Hospital, who had another stricture at or near the bulb, I rapidly enlarged the former with the single blade and suitable forcer, to No. 13 (Weiss' gauge). I did not operate on the posterior coarctation, fearing that, as the man had a large lumbar abscess, injurious results might follow the forcing of the perineal portion of the urethra. No unpleasant consequences whatever, followed the forcing of the anterior stricture, which might be used as an argument in favour of dilators, particularly as the first use of bougies with this man, some months previously, was immediately followed by most severe symptoms, resembling those of blood-poisoning. The left claviculo-scapular articulation suppurated during the attack.

The posterior stricture yielded with facility to ordinary gum elastic instruments. The man is now in the country, and occasionally passes No. 12 bougie for himself.

Figs. 23 and 24 show the shape of forcer essential for the single blade. Four forcers, at least, should be supplied with it, viz.:— Nos. 4, 7, 10, and 13 (Weiss' gauge). It is most important that their increase in calibre from before backwards should be very gradual (Figs. 23 and 24), that they may enter the stricture and not push it before them.

I by no means wish it to be thought, that I consider the single-bladed dilator calculated to supersede the double-bladed instrument. I designed it at the outset for a urethrotome conductor, when the idea also struck me, that if the forcers are formed as I have mentioned, it could, in careful hands, be used as a slow dilator,

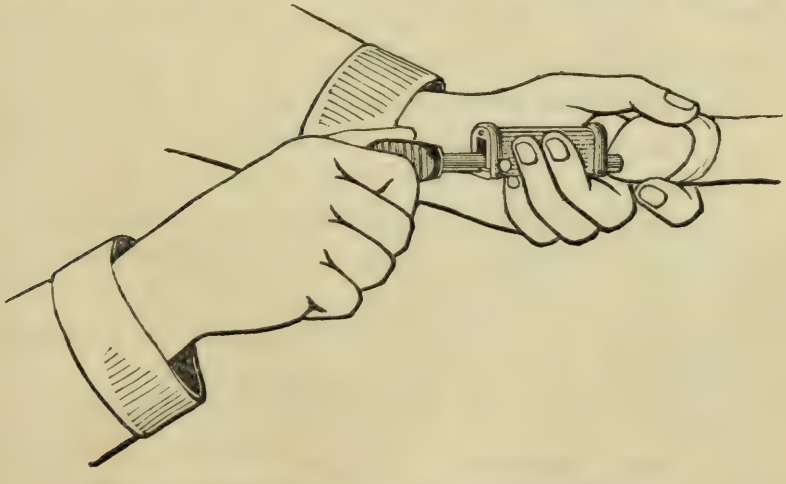


Fig. 28.—Method of using the single-bladed dilator.

provided care is taken to hold firmly both the glans penis and handle (Fig. 28), while the forcer is entering and dilating the stricture. For, should the glans be not fixed and kept well forward, the stricture will most probably recede before the wedge and not be penetrated.

The case of J. S.—— proves that it may be used for rapid dilatation.

The urethrotome and single-bladed dilator are likewise kept in stock by the Messrs. Fannin.

[Since this paper was sent to press, I received the following note, with case, from my friend Dr. Cruise, whose observations I value most highly, knowing that he is eminently qualified for appreciating the mechanism of the dilator]:—

"3, Merrion-square, West,
"*July* 11*th*, 1868.

"My Dear Mr. Richardson,—I send you a brief note of the case of stricture which I dilated some time ago, with your instrument.

"The case is no ways special, but being an old, hard, tight contraction, fully tested your dilator.

"I have no hesitation in stating that, in my opinion, your instrument is superior to any other hitherto devised for forcing strictures—superior to Perrève's original dilator, and to Holt's modification thereof. Its action is perfectly smooth, its safety absolute, and—thanks to the novel handle—it is most convenient in use.

"The case is as follows:—

"R. W——, aged thirty-two, entered the Mater Misericordiæ Hospital, under my care, March 13th, 1868. His principal suffering at the time of admission arose from an abscess in the scrotum, which had formed close to a fistulous orifice through which nearly all the urine habitually passed. Since the formation of the fistula, a sequel of perineal abscess, dating two years back, scarcely any urine had passed through the penis. The original stricture was of eight years' duration, and followed a severe gonorrhea.

"I immediately opened the scrotal abscess, kept the patient in bed for a couple of days, and poulticed, &c.

"On exploring the urethra, I discovered a tight contraction, about four inches from the glans. With some difficulty, I got in No. 2 wax bougie, and, after a few days, succeeded with No. 3. As the

stricture was hard and gristly, I determined to burst it, and, accordingly, introduced your dilator, March 24th, 1868. Having done so, I passed in the largest sized forcer, with the greatest ease, and then withdrew the instrument. I directed for the patient a warm hip bath, some quinine with opium, and abstained from introducing any instrument for two days. At the end of this time I passed, *with facility*, a No. 10 gum elastic catheter. The patient never manifested an untoward symptom.

" From the time when I dilated the stricture the perineal fistula commenced to close, and soon contracted to a mere pinhole. I detained the patient in hospital for two months after the operation, in order to watch his progress. At the end of that time the fistula gave no trouble, and No. 10 catheter was passed with the most perfect freedom.

" Should you wish to publish this case, I need hardly say you are quite welcome to do so. Meanwhile, I remain,

" Dear Mr. Richardson,

" Faithfully yours,

" F. R. Cruise.

" B. Wills Richardson, Esq.,

" North Frederick-street, Dublin."

[Within the last few days Messrs. O'Neill and Thompson, of Henry-street, Dublin, forwarded to me for approval, some specimens of the dilators and urethrotome, which, they state, were made on their premises. These instruments are excellently shaped, well constructed, and highly finished.]

Art. IX.—*On the Postural Treatment of Prolapse of the Funis.* By George H. Kidd, M.D., F.R.C.S.I., Assistant Master Coombe Lying-in Hospital, Dublin.

Notwithstanding the very numerous methods that have been suggested for the management of prolapse of the funis, it must be admitted that we have not yet achieved any great success in the treatment of this complication of labour, seeing that the average result is the loss of more than one-half of the children, and that even in the most experienced hands the success is not much greater.

I do not mean, however, to enter into the statistics of the sub-

ject at present, or even to canvass the merits of the several plans of treatment that have been recommended, but rather to direct attention to the method of which Dr. Thomas, of New York, published an account in 1858. This method is briefly described in the late editions of Churchill's "Midwifery," but I cannot find that either in Ireland or England cases have been recorded in which it has been practised, though three very excellent papers have been published on the subject by our Scotch *confrères*.

The method has one thing to recommend it beyond most others, viz., that it is easily accomplished, and adds nothing to the risk of the mother, and may be tried at a period when most of the others are quite impracticable, and its failure does not prevent the subsequent adoption of any other plan.

The mechanism of this method of treatment may be most clearly apprehended by first considering the mode in which the displacement most frequently takes place.

When a woman is in the erect posture, the axis of the gravid uterus is downwards and backwards, and consequently, if the funis be long, it gravitates to the lowest part of the uterus, and if the liquor amnii escape suddenly, may very readily be carried through the os with this fluid. When the woman lies on her back, or on her side, though in less degree, the cord has still a tendency to fall through the os uteri; and, when this accident occurs, if we attempt to replace the prolapsed portion, when the woman is in either of these positions, we almost always find that as quickly as we push up one

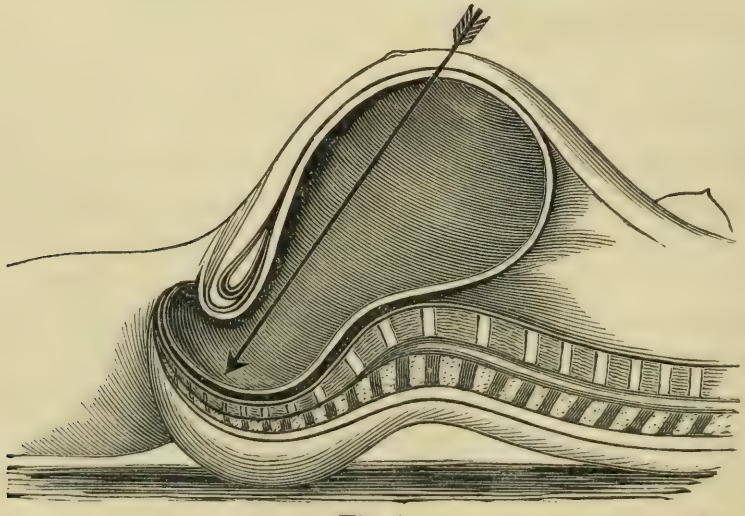


Fig. 1.

loop, another comes down, owing to its own weight, its natural lubricity, and the inclined plane formed by the uterus. Now the

postural method reverses this inclined plane, by making the fundus the lowest part of the uterus, and thus makes the natural gravitation of the cord and its lubricity assist us to replace it, instead of being the chief obstacles.

To effect this, the patient is placed on her knees and elbows, with her shoulders as much depressed as possible, and her head down on the bed. In this position the cord has a tendency to roll into the uterus instead of out of it, and if the membranes be unbroken, this position will often, of itself, suffice for the replacement of the cord; but, if the waters have escaped, it may be necessary to push up the head, and carry the cord up with the hand till it is free of the head, and can slip back into the uterus. A pain or two now borne in this position brings the head to fill up the os, and so prevents the cord again falling through.

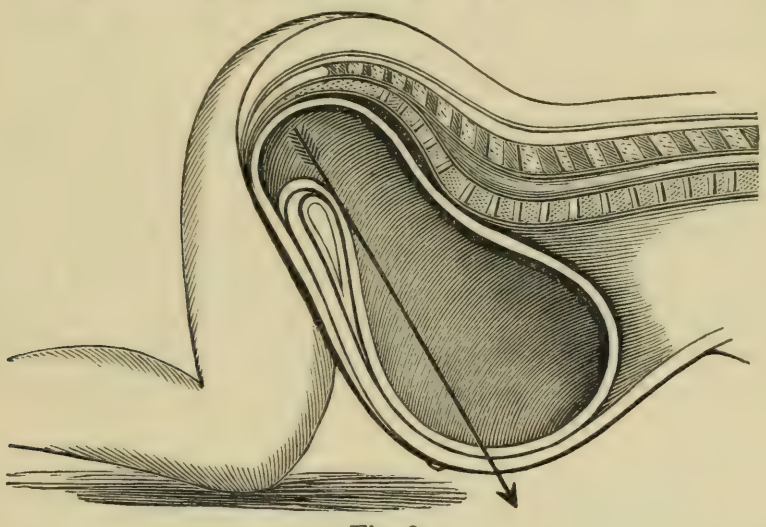


Fig. 2.

The accompanying diagrams, copied from those originally published by Dr. Thomas, illustrate this very clearly. In the first, the woman is supposed to be lying on her back, and the arrow shows the axis of the uterus and the direction in which the cord would have a tendency to fall from its own gravity. In the second, the woman is placed on her knees and elbows. The axis of the uterus is now reversed, and both the weight of the cord and its lubricity favour its descent to the fundus, in the direction indicated by the arrow.

In the month of December last, I was asked to see a woman in labour of her second child, as the funis had prolapsed and was still pulsating. The waters had escaped early in the labour. I found the os dilated about an inch in diameter; it was hard, rigid, and

unyielding, with about six inches of the cord hanging out of it in a loop, and still pulsating; the head was presenting, and the pains were slow, inefficient, and irritating.

It was evident that version or the use of the forceps was out of the question, and that to replace the cord was the right mode of treatment; and, as I had but little faith in the other methods of doing this, I resolved to give the postural plan a trial; I accordingly placed the woman as Dr. Thomas recommends, and was greatly pleased to find the cord almost at once return into the uterus, and, on my gently raising the head, pass from out of reach of the finger altogether. The woman remained in this position till she had three pains, after which I allowed her to lie down. Labour proceeded slowly, but the cord did not again pass out of the os; and, at the expiration of fourteen hours, a living and healthy child was born—a result altogether due, I believe, to the adoption of the postural method of treatment.

In this case the cord lay in front of the head, that is, between the head and the anterior lip of the uterus, and I believe this accounts, in some degree, for the ease with which the prolapse was reduced. The condition of the os contributed to this also, that is, its not being fully dilated, and its not embracing the head; but in the following case which I saw lately, under the care of Dr. Ringland, these conditions were reversed, and it was necessary to introduce the hand into the vagina, to accomplish the replacement of the cord.

A woman in labour of her fourth child was admitted into the Coombe Lying-in Hospital on Saturday, 4th July. On examination it was found that the membranes were ruptured, that the os was fully dilated, and the head about to pass through it and enter the brim, and that about twelve inches of the cord had escaped out of the uterus, between the head and the posterior lip, and formed a considerable coil in the vagina, and was still pulsating. Having placed the woman on her knees and elbows, Dr. Ringland and I both attempted to reduce the prolapsed cord by pressing back the head with a finger placed in the vagina, but could not succeed, whereupon Dr. Ringland, keeping the woman in the same position, passed his whole hand into the vagina, with the determination to turn the child if he could not get the cord replaced. This, however, was not necessary, as he found he could now carry the prolapsed cord into such a position that it slipped back into the uterus when he made slight pressure on the head, and thus, though the woman

had to suffer the pain of having the hand introduced into the vagina, she was saved the still greater pain and the great risk of having it introduced into the uterus for the operation of version, and the child was placed in the state of greatest possible safety instead of one of extreme danger.

The woman remained in this position till she had two or three pains, when she was allowed to lie down, and in an hour afterwards she was delivered of a living child, and though it died on the third day after its birth, the success of the operation was complete and satisfactory.

Though we are indebted for our present knowledge of this mode of treatment to Dr. Thomas, with whom the idea seems to have been original, it appears from certain researches recently made by Dr. K. F. J. Birnbaum, and of which a sketch is given in the *New York Medical Journal* for January, 1868, that frequent mention has been made from time to time by authors of the advantages to be derived from posture in the management of cases of prolapsed funis. Thus Kiestra recommended, in 1855, essentially the same procedure, but speaks of it as the revival of an old treatment long ago recommended by Camper and Deventer. To Camper's works, published in the middle of the seventeenth century, he had not access, but he describes Deventer as treating of the entire subject of prolapsed funis *in extenso* in a work published in 1701, and specially desiring the midwife, when the cord is pressed against the pubes or sacrum, to place the woman on her knees, with her body thrown forward, and the accoucheur to then raise the head and return the cord. Two English authors—Mowbray in 1724, and Bracken in 1737—gave similar advice, and Ludwig Wilhelm von Knœr, in 1747, and George Daniel Bœssel, in 1756, recommended that the woman should be placed on her knees during cephalic or podalic version, to prevent protrusion of the cord. Van Ritgen, in 1838, also recommends the patient to be placed on her hands and knees, and states that this sometimes succeeds without any manipulation; and Theobold, in 1860, "considered the most favourable condition for the return of the funis was to place the woman upon her head, but in view of the difficulty attending the execution of this manœuvre, compromised the matter by suggesting the position on the elbows and knees."

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

RECENT RESEARCHES ON THE PATHOLOGY OF TUBERCLE.

Etudes sur la Tuberculose. Preuves Rationelles et Experimentales de sa Specificité et de son Inoculabilité. Par J. A. VILLEMIN, Professeur agrégé a l'Ecole Impériale du Val de Grace. Paris: 1868. J. B. Baillière et Fils.

Studies on Tuberculosis; Rational and Experimental Proofs of its Specificity and Inoculability. By J. A. VILLEMIN, &c.

The Nature and Affinities of Tubercle; being the Gulstonian Lectures for the Year 1867. By REGINALD SOUTHEY, M.D., Oxon.; Fellow of the Royal College of Physicians; Assistant Physician to St. Bartholomew's Hospital; late Radcliffe Travelling Fellow. London: 1867. Longmans.

On the Inoculation of Animals as a Means of Diagnosis in Tubercular Phthisis. By W. MARCET, M.D., F.R.S.; formerly Assistant Physician to St. Bartholomew's Hospital—*Medico-Chirurgical Transactions*, 1867.

THE recent researches into the nature and production of morbid structures which have been, and continue to be, pursued with great energy and zeal, have led to a complete reinvestigation of the whole subject of tubercle, and have opened up a number of questions which seem likely to lead to some important modifications in the views hitherto generally held. Always regarded with the interest which its immense importance naturally excited, the intrinsic difficulty of its study made real progress so slow and so embarrassed that it might almost be said that no important advance in the pathology of tubercle had been made from the time of Laennec till the publication of the remarkable researches of Virchow.

This consummate observer, who has almost changed the entire face of pathology, has given an account of the mode of its formation, which is now generally adopted, in all its essential parts at least, by pathologists, and which differs widely from that taught by Laennec or by Rokitansky.

As Virchow's teachings are still not familiarly known in this country, we propose to allude briefly to some of the more important points in his general pathological doctrines which bear more especially on the subject of tubercle, and with which some acquaintance is necessary to the comprehension of his views with regard to that morbid substance.

The fundamental doctrine of the cellular pathology, of which Virchow is the originator and exponent, may be said to be embraced in a few propositions which are capable of being briefly and intelligibly stated.

The ultimate active elements of the organism are cells. By these the tissues are originally formed, and by these the vital operations in the fully-developed body are carried on. They are susceptible of great varieties in shape and in size; the amount of inter-cellular substance between them may be considerable, or the reverse; they may undergo modifications so great as to render their original cellular character no longer recognizable; yet they constitute the basis for all the phenomena of life.

Every cell must be derived from a pre-existing cell—*omnis cellula e cellula*—and the theory of blastemata, and of free cell-formation of Schleiden, and the molecular theory of Bennett, are alike devoid of foundation.

Every cell possesses an independent life of its own; its nutrition may be impaired or increased; its development and reproduction may be variously influenced; but it possesses an individual existence and action—an autonomy—which is its special attribute.

Not only is it from the cell that all the normal or physiological tissues are formed, but it is from the cell that all pathological growths are derived—in fact the cell is the element whence all structures in the body, whether in health or in disease, are originated.

The connective tissues of the body are the source whence the great majority of pathological new formations are produced. These tissues, which comprise the areolar, the fibrous, and the elastic tissues, as well as the animal basis of bone, cartilage, the neuroglia, mucous tissue, and others, which, in fact, form a continuous framework for the entire body, contain an abundance of cellular elements—the

connective-tissue corpuscles—which may be regarded as the common stock of germs for the body.

If we have clearly in our minds the idea of the independence and individuality of the cell, we get rid of the notion of a central source whence the operations of the economy are set in motion, and we get a clearer conception of the true relations of the nervous system to the rest of the organism. Formerly, everything which took place in the body was referred to nervous influence or to vascular action. According to Virchow, neither nerves nor vessels have the slightest direct influence either on healthy nutrition or on the development of morbid structures. They are only of importance in so far as they regulate or furnish the supply of nutrient material which is necessary to build them up. In support of this important proposition illustrations and arguments are drawn from a vast range of physiological and pathological facts, of which we can only notice a few.

Embryology has shown that the growth and development of parts can take place without nerves, antecedently, even, to the formation of the nervous system at all. Vegetable physiology has taught us that processes analogous to those which are observed in animals go on in plants without the possibility of the intervention of nerves; that morbid swellings are formed as the result of injuries to the bark or to the leaves of trees, which in their mode of origin closely resemble those which are found in the animal body; and we have learned, from the remarkable experiments of Paul Bert, that even a portion of an animal, after having been completely separated from the body, can enter into direct vascular connexion with the body of another animal, can be nourished by it, can grow at its expense, and can in all respects become an integral part of its body.

The same conclusion as to the independence of the cell is arrived at from a consideration of various pathological facts which have been adduced by Virchow. Diseased actions, for example, go on in parts altogether unprovided with nerves in exactly the same manner as they are found to occur in parts which are supplied with nerves, evidently as a result of the action of the individual elements of the parts concerned.

It will be readily understood, from what has been already said, that according to the cellular pathology there can be no morbid structure or product which is not the result of cell action of one kind or other. The vital energy of the cell may be perverted, may

be altogether destroyed; but as long as it does exist it is a definite thing beyond which, in our explanation of pathological processes, we find ourselves unable to get. Again, every pathological formation must be derived, at its beginning, directly from a physiological tissue, and this enables us easily to comprehend how it is, as microscopic researches conducted by many of the most competent observers have shown to be the case, that every pathological tissue has a physiological prototype.

There can, accordingly, be no heterologous tissue in the body in the sense in which heterology was understood by Laennec—namely, as a character of structure, distinctively morbid, and to which nothing analogous exists naturally in the system. What does occur with regard to pathological formations is that a structure may be formed at a place where it ought not—Heterotopia; or a time when it ought not—Heterochronia; or to an extent which is unusual or incompatible with the purposes of the organism—Heterometria. Every morbid growth, then, is formed on some model which had previously existed in the economy. Colloid growths can be referred to the histological type of the umbilical cord; pus globules are perfectly similar to the colourless corpuscles of the blood; cancroid resembles epithelium; enchondroma is constituted like cartilage; and even cancer and tubercle, long regarded as unquestionable examples of heterology, have analogies with other structures formed in the body. The word heterologous is applied by Virchow to morbid structures which do not reproduce the type of the part where they are found, but present some other type of formation; and it is only in this restricted sense that he employs the term.

As new formations are produced at the expense of the elements of a part, it follows that the elements from which they are derived must cease to exist; and accordingly every kind of new formation possesses, as far as the normal structures are concerned, an essentially destructive tendency. There is no such thing as a deposit of morbid material additional to the original anatomical elements of a part, and deposited between them; no blastema, or aplastic or cacoplastic lymph substances, so long regarded as essential to the formation of diseased structures.

A point of essential importance with regard to the discovery of the real nature and affinities of a morbid structure is, that it should be subjected to examination at the most suitable time for the recognition of its character—namely, at a period before it has

begun to experience the degenerative changes which accompany decay, and on the other hand not before it has attained a sufficient stage of development to enable it to present its distinctive characters. It is from neglecting this precaution that pathologists have been led into error with regard to many new formations, and specially with regard to tubercle.

When we come to examine what is the cause which leads cells to deviate from their natural course of reproduction, and to give birth to the aberrant and misshapen structures which are found in disease, we feel at once that we are entering upon dangerous ground. Virchow tells us that it is owing to a peculiar irritation. A certain excitation, he tells us, is necessary for the production of any vital act. Action is necessary to produce reaction. It is from some error in this irritant or excitant, some excess in amount or in degree, or some abnormal character, that morbid instead of healthy reaction is induced. This is the Reiz, which in the system of Virchow plays so important a part, and which can only be regarded as a plausible hypothesis to account for the facts which are observed.

These preliminary observations will make the account to be given of tubercle more intelligible. If a small semi-transparent tubercular granulation from a serous membrane be subjected to microscopic examination, we find that it contains a number of different elements. In the centre is a mass of granular debris giving evidence of degeneration, and containing molecules of fatty matter, and amorphous bodies with some inter-cellular substance. As you examine in the direction of the circumference cells are seen, some with only one, some with a considerable number of nuclei contained in them, and quite at the circumference of the growth are cells closely resembling the connective-tissue corpuscles, from which they only differ in having a greater size and in containing more nuclei.

The explanation of this is as follows:—The connective-tissue corpuscles under the influence of some morbid irritation begin to proliferate with unusual rapidity, the process beginning at the part which ultimately becomes the centre of the nodule; new generations of corpuscles become rapidly developed, and the irritation extends from the central point to the neighbouring parts; soon by the rapid divisions which the cells undergo they come to press upon each other, and not only interfere mutually with their development but obliterate the little vessels which supply them with nourish-

ment, and as a necessary result themselves degenerate and decay. So that the little mass may be said to consist of three concentric zones representing different stages of development—an external zone, in which the cells depart but little from the normal type, and exhibit the earliest and slightest evidences of the abnormal excitation; a middle zone, in which they are proliferating rapidly; and, finally, an inner, consisting of nuclear bodies and amorphous elements, which may be regarded as the final product of the degenerative multiplication of the elements, and of the mutual pressure to which they have been subjected.

It is by this process of degeneration, so induced, that the cheesy material is produced which was so long regarded as the characteristic form of tubercle; nor is it difficult to see how the error arose. When yellow cheesy masses were found in the lungs, and in other organs of phthisical patients with great regularity, and when grey granulations were met with, which were evidently undergoing a transformation into a similar material, it was natural to suppose that the yellow tubercle was the characteristic form of the morbid product; and when, on microscopic examination, this substance was found to exhibit amorphous bodies, evidences of degeneration, absence of vessels, and other marks of an undeveloped substance, observers were not unnaturally led to regard tubercle as mere deposit from the vessels, incapable of organization and development.

A careful study of the grey granulation has, however, brought about a change in opinion, and has shown that what was formerly denominated crude tubercle is, in reality, the morbid product at its highest stage, and in its most typical development, and that the cheesy masses are only the result of the degeneration of the grey tubercle. Besides, the study of the forms of degeneration to which different tissues are liable has shown that it is not from tubercle alone that these cheesy masses are derived, but that syphilitic tumours, lymphatic glands, pus, cancer, and sarcomata, may undergo a similar metamorphosis. The conditions necessary to the production of these cheesy masses are that the degeneration should affect elements rich in solids and in saline ingredients, and relatively poor in juices, and that the fluids should be absorbed as the change progresses. There is a close relation between the degeneration in question and the fatty and cretaceous degenerations, fat being developed and gradually absorbed, leaving a substance which has the consistence of mortar, and, finally, by the still further

removal of the fat, a cretaceous mass which may ultimately become very hard.

If, now, we inquire whether there is anything specific in the constitution or composition of the tubercular granules which have been described, the reply must be in the negative. Lebert believed that there were certain solid corpuscles which were pathognomonic of tubercle, but this has been conclusively shown to have been an error on the part of this distinguished observer. It is only by taking into consideration all the circumstances of its origin and progress, its distribution, its seat, its concomitant symptoms, and its termination, that we are enabled to define a certain product as unequivocally tubercular. It is probable, indeed, that there are delicate internal differences, could we ascertain them, which really determine the subsequent course to be taken by the cell, but our means of investigation fall utterly short of their detection. As we shall have occasion to mention presently the structure of tubercle is very closely related to that of some other pathological formations which are grouped together into a series.

When we endeavour to discover, also, to what cause is the morbid impression owing, which is the starting-point of the diseased process, we are met by an insuperable barrier. That there is a definite cause which gives rise to these deformed and aborted cell derivations is pretty certain; its nature altogether eludes our observation. Something like the progressive degeneracy and decay which the Epicureans imagined to be the inevitable portion of the human race seems to have smitten the cells which are affected, and to have imprinted a constantly and rapidly increasing deterioration on every effort of their formative activity:—

> Aetas parentum, pejor avis tulit
> Nos nequiores, mox daturos
> Progeniem vitiosiorem.

We have dwelt on these somewhat speculative points because Virchow's doctrines are accepted implicitly by the writers whose works we are about to notice, and are made the basis of deductions and amplifications, some of which we shall have to discuss.

Of the works mentioned at the beginning of this article the first is by much the most elaborate and important. Dr. Southey's lectures contain an excellent summary of some of the views of Virchow, of whom Dr. Southey is evidently an enthusiastic disciple. Those who wish for a brief and judicious account of the

latest investigations on the structure and the affinities of tubercle will find this work valuable. Those who desire to become more fully acquainted with the doctrines of the great Berlin pathologist will find much fuller and more elaborate details in Virchow's "Cellular Pathology," which has been admirably translated by Dr. Chance, and in the great work on Tumours now in course of publication.

M. Villemin also adopts, unreservedly, the conclusions of Virchow with regard to the textural origin of tubercle. But his work has a much wider scope than the study of the histology of tubercle would involve. Written with great clearness and fulness, and possessing, in a high degree, the admirable method which is so valuable a characteristic of good French works on scientific subjects, M. Villemin's studies form an important contribution to the literature of this much discussed subject.

We have some remarks of considerable interest on the question of the production of pulmonary tubercle. Special embarrassments have been met with in the investigation of this point, owing to the difficulty of ascertaining the existence of the cellular elements necessary for its production. The explanation offered by Schroeder Van der Kolk, and by others, is that tubercle may be developed in the interlobular areolar tissue from the connective-tissue corpuscles, or in the air-cells from the epithelium, which is found on their internal surface, by the usual method of degenerative proliferation. On the other hand anatomists of the highest rank, such as Henle and Luschka, and pathologists of the greatest eminence, deny the existence of epithelium in the air-cells. Villemin, who formerly was of opinion that there was epithelium in the air-cells, has now given up that view, and states that, by some improvements he has introduced in the method of preparing the lung for microscopic examination, he is able to demonstrate not only the absence of epithelium but the presence of bodies having all the characters of cells in the capillary interspaces which are found in the walls of the air-cells. It is from this element that tubercle, in his opinion, is formed. When the proliferation has lasted for some time the partitions which divide the air-cells from each other, are thickened and come to consist of a species of cellular tissue, which gradually encroaches on and diminishes the cavity of the air-cell. A number of enlarged and proliferating cells become detached and fall into the cavity of the air-cell, where, being less provided with nutriment than elsewhere, they undergo various changes which has led to the erroneous belief that they have originated in epithelium.

We have already pointed out the sources whence cheesy substances may be derived, and shown that they may arise from the degeneration of other products besides tubercle; and we have alluded to the fact that masses of this character were long regarded as the typical form of tubercle. By a curious and not unusual change some pathologists have now gone to the opposite extreme, and seem inclined to deny altogether the name of tubercle to this substance, and we find Dr. Southey following Virchow in throwing doubt on whether the masses which are found in the apices of the lungs, and which lead to the formation of vomicæ, are of a tubercular nature at all. He suggests that they may be produced by scrofulous bronchitis or pneumonia, and that their presence at the summit of the lung so long regarded as a strong evidence of their nature, may be merely owing to the fact that from that situation they cannot so easily be dislodged by expiratory efforts as they can be from other parts of the lung.

This opinion appears to us as being at least doubtful. We cannot distinguish by any test, microscopic or other, whether a cheesy mass has taken its origin in a tubercular growth or in an inflammatory product, nor whether it is the result of the degeneration of a mass composed of several different pathological formations. So that it seems impossible, at present, to affirm with any degree of certainty the non-tubercular character of the morbid product in question. For ourselves, we must say, that hitherto we have seen no evidence adduced sufficient to lead us to doubt the correctness of Laennec's doctrine of the invariably tubercular nature of pulmonary consumption.

The relation which exists between scrofula and tubercle has been recently investigated with considerable care, and as this point is one of much interest, we propose to consider it with as much brevity as is possible.

Few questions in pathology have given rise to greater perplexity than the precise signification of scrofula. Frequently understood as commensurate with tubercle, frequently taken in a wider sense as including tubercle and much besides, and exhibiting in its manifestations a similarity to the developments of tubercle so striking as to have given rise to a strong conviction of their being of a kindred, if not identical nature; scrofula has afforded a remarkable example of the employment of a term utterly vague and unsatisfactory as regards any possibility of logical definition, yet possessing a distinct and unquestionable practical value. Investigating the

pathological position and relations of scrofula by the light of the recent advances in our knowledge of morbid processes, it would seem as if our conception of it requires material alteration.

At present pathologists are disposed to regard scrofula and tubercle as altogether distinct from each other. They believe them to differ in seat, in their component elements, and in their mode of arrangement, and they regard the diathesis from which they spring as essentially different. In fine, scrofulous affections have nothing in common with tubercular affections, except that in both the mode of origin is similar, and that, in both, the products of degeneration are identical. This latter character—the power of forming cheesy substance—being, as we have already more than once said, shared by other morbid structures.

An important pathological distinction between scrofula and tubercle consists in this, that the scrofulous glandular enlargement is formed exactly on the pattern of the pre-existing tissue, and is, consequently, a strictly homologous growth, according to the limited signification in which homology is understood by Virchow—namely, an adherence to the type of the part where a pathological new-formation is produced. Tubercle, on the contrary, is uniform wherever found, and, consequently, does not re-produce the type of the part in which it occurs. It is, accordingly, heterologous in the sense in which this term is used by Virchow. It will be seen that no weight is attached to the actual histological structure of a morbid growth in determining its homologous or heterologous character, but that it is assigned to one or other group according to the relation subsisting between it and the part in which it is found.

Scrofula, according to Virchow, manifests itself by hypertrophy or hyperplasia of certain groups of glands. The changes which these undergo being anatomically recognizable, the cellular elements of the glands are increased in number and altered in appearance, and the connective tissue of the glands also undergoes hypertrophic changes which lead to induration of their substance. The glands thus altered are subsequently the subjects of the morbid changes which are familiar to every one. Under the name "lymphatic tumours," he groups together the glandular enlargements observed in Leucemia, or, as it has been named by Bennett, "Leucocythemia;" the enlargements which are found in typhoid fever affecting the lymphatic glands of the mesentery, the solitary glands, and Peyer's patches; syphilitic gland affections, and, omitting several forms, scrofulous glands: these form one division. Another

division of the same class includes tubercle and parresyge. So that the relation to tubercle, possessed by scrofula, is one which is shared by diseases as widely different from each other as syphilis and typhoid fever.

The clinical differences between them are also well marked. The general appearance and habit of body of a scrofulous person is not the same as that of a phthisical subject. Villemin, indeed, is disposed to narrow considerably the field of scrofulous affections, to deny to them any special anatomical characters whatever, and to refer them altogether to an exaggerated excitability of that part of the vegetative system which is composed of lymphatics and connective tissue, leading under slight irritation to prolonged inflammatory disturbances. When growth is most active, and when the body is enlarging, then it is that the manifestations of scrofula are noticed, and they disappear usually after puberty. Tubercle is very frequently found in adult life. Scrofulous affections also are excited by the most varied and ordinary causes, and have consequently nothing in common, in this respect, with tuberculosis, which is the result of a general cause affecting the entire organism.

It follows as a corollary from what has been hitherto stated, that if we accept the fundamental doctrines of cellular pathology, while we must recognize in the phenomena presented to us in the course of tuberculosis, in the simultaneous or successive appearance of tubercles in a number of different organs, the action of a general cause, we must also admit the existence of direct pathological irritation exerted at a number of different points, and giving rise to the granulations which are found on examination. Nor is there anything in this incompatible with the idea of a general cause, that is, of something of a morbific character diffused throughout the system. Special affinities undoubtedly exist between particular substances and particular parts of the organism. Mercury, we are aware, attacks the gums, cantharides the genito-urinary organs, lead the muscles, and we might easily add many more instances of the same kind. It is not that the substances we have named are not diffused throughout the body, but that certain elements are, as far as is known to us, insensible to their action, while certain other parts are injuriously affected.

What is observed with regard to these medicinal substances is also, as Villemin urges, noticed in the case of morbific agents, whose nature is unknown to us, but which we recognize by their

effects. The poison of variola causes inflammation of the epidermis, leading to the formation of pus. The pustules are identical, as far as their contents are concerned, with others which can be produced by artificial irritation. What is specific, is, not the suppuration but the form and evolution of the eruption, and the general symptoms which accompany it. Now, it is similar with regard to tuberculosis, according to Villemin. In this case also we have a virus circulating in the system, and, through a special affinity for particular parts, exhibiting the effects of its presence in different parts of the body. Accordingly, he considers that its pathological affinities are with syphilis or with glanders, and that it really belongs to the class of zymotic diseases. Those familiar with periodical medical literature will remember that a similar statement was made by Dr. William Budd some time ago, and that it attracted a good deal of attention at the period when it was first published by its distinguished author.

One of the most remarkable and interesting chapters of M. Villemin's work is devoted to the pathogenetic conditions of tuberculosis. The author argues, with remarkable ability, in favour of the possibility of the transmission of tubercle by contagion. He believes that there is sufficient evidence of its kinship with zymotic maladies to render this antecedently probable, and he adduces some important considerations bearing on this subject, which we may summarize as follows:—Phthisis is comparatively rare at great altitudes, while, on the other hand, it is very prevalent in low situations. This peculiarity in its topographical distribution has been noted by many observers, and receives a remarkable confirmation from the observations of Dr. Archibald Smith, which were recently published in this journal. Various explanations have been offered to account for the singular immunity possessed by the inhabitants of those elevated regions, such as diminished atmospheric pressure, dryness of air, etc. Villemin regards these as unsatisfactory, and refers to the fact that zymotic diseases generally are very rare at high elevations, as accounting for the circumstance, and as affording a proof of the close relation which exists between tuberculosis and zymotic maladies. Another argument in favour of this analogy is the increased amount of tubercular disease in large centres of population—an increase which is regarded by some observers as being in the direct ratio of the agglomeration of the population. No matter what interpretation we may be inclined to put on it, there can be no doubt that

in rural districts, and in thinly populated places, the frequency of phthisis is less than in cities. According to the returns of the Registrar-General, the inhabitants of towns show a proportion of a fourth more deaths from phthisis for the same number of the population.

But there is a still more remarkable fact, and one on which Villemin lays great stress, namely, that consumption is much more frequent among the inmates of barracks, prisons, and factories than even among ordinary town populations. This, he regards, as only explicable on the zymotic theory of the disease. In his work on practical hygiene, Dr. Parkes has given some important statistical results bearing upon this point. According to the returns, the proportion of deaths from tubercular disease in the army is greatly above that of healthy districts of the country, and the proportion in some arms is absolutely enormous. The tables show, Dr. Parkes observes, "that there must be a large amount of phthisis generated in the army; and in the Foot Guards it would seem to be nearly four times as much as among the civil male population of twenty-five to forty-five years of age."

The Cent Gardes, who may be regarded as the flower of the French army as regards physical development, show a mortality of 9 per 1,000 annually from tubercular disease, while the mortality from the same cause in the City of Paris is only 4·6 per 1,000.

There is some evidence also in favour of the belief that phthisis has only appeared in some countries after they had been visited by Europeans; a fact which, if established, would give support to the contagious character of the disorder. With regard to North America, New Zealand, and other countries, we have the testimony of various travellers that the disease was unknown before the advent of European immigrants. Of course evidence of this kind is not altogether reliable, and the facts, even if admitted, are susceptible of a different explanation, namely, that the habits of the aborigines had been deteriorated by the contact of the new settlers; but so far as they go they rather tell in favour of the transmissibility of the disease. Again, the strong popular conviction of the contagious character of phthisis is not to be overlooked. In the south of Europe the bed-clothes of a patient who has died of consumption are invariably burned, and phthisical persons are shunned as dangerous to the health of those who hold communication with them. In this country there is a deeply-rooted belief among the people, that persons brought into intimate relations with

consumptive sufferers, occupying the same bed for instance, as in the case of husband and wife, are liable to contract the malady; and the numerous instances in which the wives of phthisical persons become themselves phthisical lend some colour to the belief. Some of the most eminent members of the medical profession have held similar opinions. The following remarks, made by Andral in his notes to Laennec's treatise on auscultation, are marked by the admirable sense and by the soundness of judgment which characterize the writings of that eminent pathologist, and really represent all that can be as yet said with any certainty on the subject :—

"The fear of the contagion of phthisis pulmonalis, was, during the preceding century, carried very far indeed. Morgagni himself acknowledged that he ventured to make but very few *post mortem* examinations of the bodies of phthisical patients, for fear of taking the disease. He retained this prejudice during his entire life; as we read in one of his letters the following phrase: *phthisicorum cadavera fugi adolescens, fugi etiam senex.*

"No doubt the facility of the contagion of phthisis pulmonalis has been very much exaggerated. Still is it wise to deny it absolutely and in all cases? Who could venture to affirm, that a disease which can never be considered as purely local, and which, according as it advances, presents, as it were, an infection of the entire system, is not susceptible of being transmitted in cases where very close and continual contact (as lying in the same bed) exposes a healthy individual to absorb the miasms driven off both from the pulmonary mucous membrane and the skin of a phthisical patient? I certainly have been more than once struck at seeing women begin to present the first symptoms of pulmonary consumption a short time after their husbands had died of this disease. At all events, the facts ascertained on the subject of the contagion of phthisis are of sufficient importance to induce those who are in constant attendance on phthisical patients to take all possible precaution, more especially during the advanced stage of their disease."

Villemin refers to the following curious statement made by Laennec himself, which we have deemed of sufficient interest to reproduce here :—

"Can direct inoculation produce the development, at least the local development, of tuberculous matter? I have but a single fact on this head, and, although a single fact proves little, I think it ought to be stated here. About twenty years ago, whilst examining some vertebræ in which tubercles were developed, I slightly grazed the index finger of my left hand with the saw, but paid no attention to it. On the next

day a little redness appeared on it, and there was formed by degrees, almost without pain, a small roundish tumour, which at the end of a week had reached the size of a large cherry-stone, and seemed situated in the substance of the skin. At this period the epidermis cracked over the tumour just at the spot where the saw had passed, and exposed to view a small yellow body, firm, and precisely resembling a crude yellow tubercle. I cauterised it with deliquescent hydro-chlorate of antimony (*butter of antimony*), which gave me scarcely any pain, and when after a few minutes the salt had penetrated the whole of the tumour, a slight pressure removed it in an entire state. The action of the caustic had softened it so far as to render it exactly like a softened tubercle of friable consistence. The place which it had occupied formed a species of small cyst, the walls of which were of a pearl-grey colour inclining to a semi-transparency, and without any redness. I again cauterized them; a cicatrix was quickly formed, and I have never since felt any inconvenience from this accident."

The treatise on auscultation appeared in 1819. In 1822 Laennec was obliged to give up practice owing to phthisis, from which he died in 1826. The coincidence is sufficiently curious, and the local effects, produced at the seat of injury, closely resemble, as will be seen hereafter, the phenomena observed in animals at the points where inoculation of tubercular matter has been practised.

It is evident that the possibility of the spread of tubercle by contagion is in direct antagonism to the generally-received opinion with regard to its hereditary transmission. If phthisis be in any considerable proportion of cases derived from parents, it would be, *a priori*, highly improbable that it should be of zymotic origin. Zymotic diseases do not remain dormant in the system for many years to break out at the end of a long period of repose. Syphilis, it is true, is transmissible to offspring, and has periods of latency during which active symptoms are absent; but even during these periods the evidences of the constitutional diathesis are distinct and unequivocal. On the other hand, phthisis manifests itself often in persons who have reached the age of twenty or thirty years with all the external characters of vigorous health.

But the evidence in favour of the wide-spread belief in the hereditary character of phthisis is by no means altogether satisfactory. Dr. Walshe, who has devoted a great deal of attention to this subject, analysed the family history of 446 hospital patients, and arrived at the conclusion "that phthisis in the adult hospital population of this country is, to a slight amount only, a disease

demonstrably derived from parents." On this question Villemin observes that the enormous mortality from tubercular diseases amounts to an aggregate so great as to render it a matter of probability that the great majority of families will have in some way become connected with it. In France, with a population of less than 40 millions, 160,000 die annually from tubercular diseases. Accordingly, about 5 millions of people have fallen victims to these maladies during the lifetime of a man of thirty years of age. In this immense number, equalling one-eighth of the population actually living, it is not to be wondered at that there should be representatives of a vast number of families, and that in tracing the genealogy of a phthisical individual, alliances can be found with some of those who have constituted this formidable total. Very much the same may be said of the family history of non-phthisical persons; in fact, as has been observed by Walshe, if we take any class of individuals in hospitals, whether phthisical or not, it will be found that a considerable proportion of the generation from which they sprang was tubercular. Undoubtedly an aptitude, or proclivity, to particular diseases is inherited; but it seems at least doubtful whether we can go further than this with regard to phthisis.

It will be at once evident that a point of cardinal importance for determining the pathological position of tuberculosis is whether or not it is capable of being propagated by inoculation. If this be determined in the affirmative, it goes a great way to establish its analogy with syphilis and other kindred diseases, and furnishes a powerful argument in favour of its zymotic nature. This, which is the experimental aspect of the question, has been examined with great industry and ability by Villemin, and it is by his observations on this point that his name has become known in this country. In France he had, already, acquired considerable reputation as an investigator. The operative procedure employed by him consisted in making a subcutaneous incision with a narrow-bladed bistoury, and introducing into the little wound a small portion of tubercle. At first he always used portions of both grey and yellow tubercle, but subsequently he employed the yellow alone, having found that it produced the effects with most certainty.

When tubercle is inoculated in this manner no local phenomena are observed for two or three days ; at the expiration of that time a little redness, with some heat and swelling, are observable, which disappear in three or four days more. Then a slight nodosity can be recognized situated beneath the skin, and movable with it,

giving to the touch a sensation closely resembling an indurated chancre of the prepuce. After a variable period an opening is formed, through which a cheesy matter escapes. This opening sometimes closes, but at the end of some time it again opens. The nodosity, which sometimes, especially in inoculations from rabbit to rabbit, attains the size of a small nut, exhibits on section the characters of a subcutaneous tubercle, and a number of small miliary granulations are found around the principal mass. The lymphatic glands, which are in connexion with the points of inoculation, invariably become enlarged, and contain granulations, sometimes, even, become altogether changed into cheesy masses. The lymphatic vessels leading from the place of inoculation frequently become converted into solid cords, and their walls are found to be infiltrated with tubercles. The lungs and other viscera also, as the kidneys, spleen, &c., are found to contain tubercle. Besides these experiments with tubercle itself, Villemin employed, for inoculation, the sputa, and even the blood of phthisical patients, and found that by these substances tubercle could be produced. He also inoculated with portions of the little tubercular masses, which, as has been described, are formed at the situation where the inoculation is practised, and found that tubercle could be produced by this method also.

On the other hand, inoculation practised with pus, cancerous matter, and other morbid products, has, in Villemin's hands, been productive of only negative results; in no instance has tubercle been produced.

Tubercle from the human subject has been inoculated by Villemin on rabbits, guinea-pigs, dogs, cats, sheep, and birds. He has also inoculated the rabbit from the cow, and rabbit from rabbit. He has found that certain species are remarkably susceptible of tubercular disease, and that certain species are, on the other hand, refractory to it; another proof, in his opinion, of the analogy between tuberculosis and specific diseases, which latter are restricted usually, perhaps universally, to a limited number of animal species. The rabbit and guinea-pig exhibit considerable proclivity towards tubercular development. The sheep and goat seem refractory to the virus.

With regard to the period of incubation of tuberculosis, Villemin regards it as being from 10 to 20 days, reckoning by the time which elapses from the inoculation until the appearance of tubercle in the lungs or other viscera. In the kidneys, or spleen, evidences of tubercle are generally found before the twenty-eighth day.

These results, which we have thus rapidly sketched, and for a full account of which we refer the reader to Villemin's work, from which we have drawn our account of them, naturally excited great attention. Nothing could be more completely at variance with the accepted pathological doctrines regarding tubercle. The non-contagious character of phthisis was regarded as an axiom; and in systematic works on medicine the question was passed over as one which did not require or admit discussion at all. Here, however, was a series of propositions, based on direct experiment, which seemed to strike at the root of our established convictions. A number of pathologists in France, in Germany, and in England, at once set about the investigation of these startling statements.

Herard and Cornil, Lebert, and Mr. Simon, arrived at results confirmatory of the direct experiments of Villemin. Dr. Marcet, who employed guinea-pigs in his experiments, suggested, in a communication to the Medico-Chirurgical Society, that the inoculation of animals might even be employed as a means of establishing the real nature and prognosis of a doubtful disease. He stated, as the result of a considerable number of observations made with much care, that the sputa of phthisical patients are capable of leading to the formation of tubercles in some animals when introduced into them by inoculation; and that if the inoculation of two or more guinea-pigs with the expectoration of a person believed to be in advanced phthisis be not followed by the development of tubercle in the animals within fifty days, we may conclude that the softening of the tubercles in the patient is, for the present, arrested, and that, consequently, his condition is relatively favourable.

The progress of experiment, however, soon began to throw some additional light on the subject of the formation of tubercle. Lebert, Dr. Sanderson, and, more recently, Dr. Wilson Fox, have shown that tubercle, or a morbid product undistinguishable from it, may be developed in animals as the result of the inoculation of various substances, or even as the result of irritation without inoculation at all. Dr. Sanderson found that the insertion of a seton under the skin of guinea-pigs is followed by the development of morbid changes of the same nature as those produced by the inoculation of tubercle, and these observations have additional weight as they were carried on in co-operation with Mr. Simon. Lebert states that he has produced tubercle by introducing mercury and charcoal into the circulation as emboli.

Dr. Wilson Fox has found that tubercle may be developed in

guinea-pigs after inoculation with vaccine lymph, and with putrid muscle, and after the insertion of a piece of cotton thread under the skin. He has found, however, that the effect in question can be more certainly produced by the inoculation of tubercle than by that of any other substance.

The result of these experiments would undoubtedly seem to overthrow Villemin's statement with regard to tubercle being only producible by the tubercular virus, but to leave untouched his statement as to its capability of being produced by tubercle. As observations multiply we shall, no doubt, gain much additional insight into these important questions. What tends in no small degree to embarrass the subject is the impossibility, with our present knowledge, of determining the tubercular character of a particular morbid product on merely histological grounds, so that we find pathologists frequently at issue on points of this kind.

If we admit, as the concurrent testimony of numerous observers indicates, that a substance which resembles tubercle so closely as to be undistinguishable from it, and which is in all probability identical with it, can be produced in the organs of several of the lower animals as a result of inoculation, we have still to seek for the interpretation of the fact. Villemin looks upon it as a proof of the virulent and specific nature of tuberculosis. Lebert, on the other hand, regards the pathological changes which are found as being in no way specific, but as entering into the general category of inflammatory processes. Again, some experiments of Goujon and Carbadé, who found that inoculations of pancreatic juice and of pigment cells from the choroid were followed by multiplication of the elements so introduced, suggest the possibility of an explanation founded on the analogy of what takes place in animal grafting—namely, that the cells which are introduced into the organism by the inoculation grow and reproduce themselves simply according to the conditions of nutrition in which they find themselves, and altogether independently of anything of the nature of infection or contamination of the system. Dr. Wilson Fox is disposed to regard the introduction into the economy of substances of a septic nature as the necessary element for the artificial production of tubercle. He looks upon the inoculation of tubercle as being only effective through that substance possessing a septic character, and not through any specific property inherent in it. He explains the effect of the seton by its setting up inflammatory action, the products of which when absorbed exercise a septic influence. Other

explanations of a more or less ingenious character have been put forward, but it cannot be said that any thoroughly satisfactory elucidation has, as yet, been arrived at.

It may fairly be asked what practical results are likely to follow from observations such as those with which we have been engaged. That Dr. Marcet's suggestions are, at least, premature, may, we think, be fairly assumed. Nor, indeed, would they possess much practical value even if their accuracy were established. Experiments of the kind which he has proposed are always difficult, liable to error, and not likely to be generally adopted by those who are engaged in the toil of actual practice. But there is some ground for hoping that from wider and clearer views of tuberculosis some important practical results may follow. Villemin, with an enthusiasm which is almost contagious, sees, in his discovery, the germ of great future benefit to humanity. He thinks that some prophylactic may be found which will procure for our race an immunity against this terrible scourge, such as the immortal discovery of Jenner has conferred upon us with regard to small-pox.

Without sharing in these sanguine expectations, we cannot but hail every advance in our knowledge of the pathology of tuberculosis as a step in the direction of the discovery of a rational and useful therapeutical management of the disease. And if its contagious character should come to be established, and the present writer regards the evidence in favour of this as very strong indeed, it will lead to great and obvious changes in our management of phthisical patients, and to the adoption of precautions which, under this supposition, would be of immense utility, and which are now generally disregarded. The field of observation is as yet only entered upon, and it will unquestionably yield a rich harvest to those who cultivate it.

On Diseases of the Chest: being Contributions to their Clinical History, Pathology, and Treatment. By A. T. H. WATERS, M.D. London: John Churchill and Sons, New Burlington-street. 1868.

DR. WATERS, to whose essay on the anatomy of the human lung the Fothergillian gold medal was awarded some years ago by the Medical Society of London, and who is favourably known to the profession by his contributions to thoracic pathology, has, in this

volume, collected together a number of papers, contributed by him to different periodicals, on some of the more important diseases of the chest. He has also reprinted a treatise on emphysema, which he had published some years ago. There are besides a number of essays in the volume which we have not before seen, and which we presume have not been previously published.

The pulmonary affections which are discussed, and which occupy the first part of the volume, are pneumonia and emphysema, which are treated at considerable length, phthisis, asphyxia, pleurisy, œdema of the lungs, and there are some remarks on pulmonary apoplexy, gangrene, and fetid expectoration.

In the second part we find chapters on the sounds of the heart, on pericarditis, fatty disease of the heart, chronic valvular disease, sudden death in relation to heart disease, thoracic aneurism, and on the use of alcoholic stimulants.

The contents of the volume are, as will be seen from this summary, of a varied and interesting character, and the subjects are treated in a thoughtful and suggestive manner.

It is to be regretted that the author, or, perhaps, we should say the publisher, has, we are sure, inadvertently, chosen a title which may possibly mislead the public as to the contents of the volume. A work on "*Diseases of the Chest*" is generally understood to be a systematic account of all the more important affections of that portion of the body. A student, attracted by the well-deserved reputation of Dr. Waters, might purchase this book with the belief that he could employ it as a text-book, in the same manner as the well-known treatises of Stokes, Walshe, or Fuller; and might fairly complain that the designation of the work had encouraged him in his incorrect estimate of its character and extent. It would be desirable that this source of error should be obviated by some addition to the title which would make it more clearly express the nature of the work, and the exact range of the subjects which are treated of in it.

The first chapter is devoted to a summary of the minute anatomy of the lung; on some points connected with which the author entertains opinions at variance with those generally adopted. His views, which deserve careful consideration, are detailed more fully in the work on the anatomy of the lung, to which we have already referred.

The subject of *pneumonia* is treated at length; the observations on this disease occupying eighty pages of the volume. Pure

pneumonia, according to the author, is essentially an inflammation of the walls of the air-sacs. The term "air-sacs" is used throughout the volume to signify the cavities "which constitute the ultimate expansions of the air tubes." Their walls consist of yellow elastic tissue, and of a basement membrane inclosing the pulmonary plexus, and they constitute the true parenchyma of the lung—the interstitial tissue, which some pathologists have regarded as being the seat of the inflammation, having no real existence in the lung, with the exception of a small quantity which invests the various tubes and vessels, and surrounds the different lobules. This is the opinion originally, we believe, expressed by the late Dr. Addison, and that which, undoubtedly, represents the true view of the disease. The vessels which are involved in the inflammation, and which furnish the inflammatory products which are poured out during its progress, are the ramifications of the pulmonary artery, constituting the pulmonary plexus. The capillaries derived from the bronchial arteries do not share in the inflammation at all, unless bronchitis be present in addition to pneumonia. In support of this view of the pathology of the disease the author adduces certain anatomical considerations as to the mode in which the lungs receive their vascular supply. It is from the pulmonary plexus that the parenchyma of the lung derives its nutrition, so that the pulmonary artery not only subserves the important function of carrying the blood to the lung, to be there subjected to the action of the atmosphere, but also supplies the materials necessary to the maintenance of the integrity of its tissue, and is, in fact, the only vessel from which branches proceed to the air-cells at all.

This conception of pneumonia possesses, in the author's opinion, the advantage of greatly simplifying our notions with regard to the disease, as it localizes it in the pulmonary plexus, and as it accounts at once for the rapid and extensive consolidation which frequently occurs by indicating a source from which abundant materials may readily be derived. It also explains why pneumonia is so often accompanied by great febrile disturbance, inasmuch as it may be regarded as a blood disease. It fails, however, we think, to explain some of the difficultieswhich beset this interesting question. The remarkable difference which exists between bronchitis and pneumonia—a difference which extends to the progress and symptoms of the two affections in as marked a manner as to the anatomical changes found in the lungs on *post mortem* examination—cannot be accounted for merely by the fact that a different set of vessels

is concerned in the inflammatory process which is the essential element in both affections. Besides, as has been well pointed out by Henle, in the recently published volume of his great work on anatomy, such a sharp division between the distribution of the bronchial and pulmonary vessels, as this view involves, is in reality impossible; not only is the bronchial membrane directly continuous with the air-cells, a fact which necessarily involves some amount of anastomosis between their capillaries; but it is stated that the pulmonary artery supplies branches which are distributed to the mucous membrane of some of the bronchial tubes themselves. Yet we do not find that the tubes to which these branches are distributed become filled with exudation. In fact we must look deeper than mere differences in vascular supply for the solution of this important pathological problem. It has been suggested by Villemin, in a paper published in the *Archives Générales de Médecine* for 1866, that the nuclear or cellular bodies which are found in abundance in the interspaces of the capillary plexus of the air cells, may furnish the element necessary for the interpretation of the morbid process in question. The existence of these bodies has now been verified by numerous microscopists of eminence, and the recognition of their presence supplies the cellular element indispensable, according to the current pathological doctrines, for the formation of the morbid proliferations which ultimately fill up the air cells.

Dr. Waters has been able to detect in two cases of pneumonia a modification of the respiratory sounds before crepitus became developed. In both cases the inflammation arose in lungs which were previously unaffected by disease, and in both a loud harsh respiratory murmur became audible, which was, on the following day, replaced by distinct crepitus. These observations possess some value with reference to the stages of the disease.

It had been taught by Dr. Stokes, that prior to the stage of engorgement there was a stage of pneumonia characterized by dryness and injection of the pulmonary membrane, and capable of being discovered by auscultation. This opinion has been generally regarded by subsequent writers on the chest, as theoretically correct, but as being of little practical value. Dr. Waters's cases furnish additional evidence of the clinical importance of the recognition of this stage, and deserve to be carefully studied. The mode of production of the normal respiratory murmur, and of this modification of it, is thus explained:—

"The air-sacs consist of somewhat elongated cavities, which communicate with a bronchial ramification by a circular opening, which is usually smaller than the cavity to which it leads, and has sometimes the appearance of a circular hole in a diaphragm, or as if it had been punched out of a membrane which had closed the entrance to the sac.

"This arrangement is best seen in the lungs of children and of adults. In old age it has frequently disappeared, more or less. It may be often well seen in a piece of lung, the blood-vessels of which have been injected with coloured size, and which, after being dried, has been subsequently soaked in spirit. By careful dissection under a microscope, the membrane, guarding the mouth of the sac, and narrowing the entrance to the cavity, is easily demonstrated. The membrane forms a part of the aerating walls of the air-sac, and has branches of the pulmonary artery ramifying in it.

"It is obvious that a condition of this kind must have an influence on the passage of the air into the air-sac; that, to a certain extent, it must produce an impediment to the current of air, and thus give rise to a sound.

"As the air is moved along the bronchial tubes it meets with no obstruction to its passage; but at the commencement of the air-sacs an opening exists which is smaller than the cavities between which it is placed. As the air-sacs expand with each inspiration, air must pass through the constricted opening. I believe that, in the passage of the air through this opening, the main element of the respiratory murmur consists."

The author believes that the harsh puerile respiration of incipient pneumonia,

"which is merely an exaggeration of the healthy sound, is the result of the dry and swollen condition of the pulmonary membrane; that this gives rise to a constriction of the mouths of the air-sacs, and approximates therefore, to the condition which they present in childhood, when a loud respiratory murmur is heard."

The treatment of pneumonia is fully discussed. The author, we think wisely, does not confine himself to any routine plan of dealing with the disease. The tendency of his treatment is rather towards the stimulating and supporting plan, although he occasionally employs remedies of the antiphlogistic class.

Antimony he sometimes prescribes, but usually only in small doses. In cases where the pulse is weak and rapid, or where there is a deficiency of constitutional power, he does not give it at all. Alcohol has been given in a large proportion of his cases, apparently

with decided advantage. When the pulse is quick and feeble, without sharpness, when there is much debility, or when delirium is present, stimulants are indicated. Calomel and opium he considers as unnecessary in the treatment of the disease, but opium alone relieves pain, allays the cough, and procures sleep. The pain in the side which physicians usually regard as a symptom to be met by local depletion may generally be relieved by a dose of opium.

Ipecacuanha is of value as an expectorant and diaphoretic, but is to be discontinued when it produces nausea.

Carbonate of ammonia and chloric ether, usually prescribed together, by Dr. Waters, are regarded as valuable from their stimulant effects.

"With regard to the administration of salines, such as citrate of potash and acetate of ammonia, I do not, as a rule, prescribe them either in this, or in any other inflammatory affection. I think it doubtful whether the routine practice of constantly administering these substances in inflammations is a desirable one. There can, however, be no doubt that they are sometimes agreeable to the patient, and afford relief to the distressing thirst which is occasionally present. Further, by supplying water and certain constituents to the blood, they may promote the action of the skin, as well as of other excreting organs, and thus have a curative effect. At the same time, I would remark, in referring to the action of the skin, that it by no means follows that the existence of the hot, burning, dry skin, so frequently met with in pneumonia, necessarily indicates the use of salines, or of antimony, or of any other of the so-called diaphoretic medicines. This condition is sometimes rapidly relieved by the sole administration of some form of alcohol; and, in fact, wine or brandy will occasionally be found the best diaphoretic we can use."

Blisters are important agents in treating the disease after consolidation has taken place. They cause contraction of the capillaries by a reflex action of the vaso-motor nerves, and assist in promoting absorption of the exudation.

Much weight is justly attached to the judicious administration of nourishment.

"For the most part, in the early stages, the quantity of food given may be safely left to the desire of the patient. As the case progresses and the appetite begins to improve, the diet should be more liberal; and you will find that, as soon as convalescence is established, solid food will be borne. In such cases as require a very early and free administration of alcobol, nutrients should be given liberally from the first. Beef-tea and

milk are usually well borne; and if the former be properly made, a good deal of nourishment may be introdnced into the system by means of it."

An abstract is given of the principal facts with regard to forty-four cases of pneumonia treated by the author, in the Liverpool Northern Hospital. Of these cases, all, with a single exception, terminated favourably, a result which certainly affords strong evidence in favour of the judicious character of the treatment employed.

Of *emphysema* we have a very elaborate account. Pulmonary vesicular emphysema he divides into three forms: lobar, lobular, and partial lobular. Of these, the first is by far the most important and formidable affection. It usually involves both lungs, and the lower as well as the upper lobes. It also generally takes its origin from constitutional causes, without antecedent cough or irritation. The other and more partial forms are not only more limited in extent, but also very frequently arise from mechanical causes.

As to the nature of the constitutional affection which gives rise to lobar emphysema, the author considers that it is impossible at present to pronounce. Degenerative changes may exist in the lung tissue, but these are not, as supposed by Rainey and Dr. C. J. B. Williams, of a fatty character, nor are they fibrous, as advocated by Sir William Jenner:—

"Notwithstanding, however, that my investigations do not enable me to say what is the exact nature of the degeneration which leads to the production of emphysema, nor yet, whether it commences as an affection of the capillary blood-vessels, or of the elastic fibres and basement membrane, I do not entertain the slightest doubt that *the disease in its severer forms is of a constitutional nature; that one of its most important features, and perhaps the primary step in it, is a mal-nutrition of the pulmonary tissue, causing its degeneration, and giving rise to all the structural changes which I have previously described.* That fatty deposit occasionally exists, I have already stated; but the question arises whether this is a primary cause of the anatomical changes which take place, or whether it may not be the result of the imperfect nutrition which necessarily ensues in the progress of the disease.

"The view which I have taken, of the constitutional nature of emphysema, receives support from the facts which have been brought forward with reference to its hereditary character. On this point I quote the observations of Jackson, which furnish us with very important results. He found that, of twenty-eight persons suffering from emphysema of the

lungs, eighteen were born of parents (father or mother) affected with the same disease, several of whom had died of it. In some instances the brothers and sisters of these persons were also emphysematous. On the other hand, of fifty persons not affected with emphysema of the lungs, three only were born of emphysematous parents.

"Facts of this kind tend to throw great doubt on the opinion that emphysema is solely produced by mechanical dilatation of the healthy air-sacs, and to favour the view that it has some deep-seated pathological cause in connexion with the lung tissue."

Regarding the causation of the partial forms of emphysema, Dr. Waters rejects the theory of Gairdner as to effect of collapse of a portion of the lung on the production of over-distention of the remaining uncollapsed portion, and regards with favour the expiratory view, so forcibly advocated by Jenner, which refers the origin of emphysema to unequal compression of different portions of the lung during violent expiratory efforts, as in coughing.

In the second part, a chapter is devoted to the sounds of the heart. The theory of Rouanet and Billing, with regard to the production of the first sound by the closure and tension of the auriculo-ventricular valves, is advocated by the author, who assisted Dr. Halford in his well-known experiments on this subject. Halford's experiment on the effect produced by the stoppage of the supply of blood to the heart, from the systemic and pulmonary veins, in causing a complete cessation of both sounds, which were again heard when the blood was again allowed to flow into its cavities, is regarded by the author, who has often witnessed it, as decisive on this point.

In the treatment of pericarditis, Dr. Waters is a decided non-mercurialist. The only fatal case of acute pericarditis, uncomplicated with Bright's disease, which has occurred in his hospital practice, during a period of eight years, was one in which, contrary to his usual practice, he had given mercury to salivation. Although this drug is now abandoned in the treatment of this disease, as well as of so many others, in which it was formerly considered indispensable by many of the ablest practical physicians of the day, yet we do not think that the grounds on which Dr. Waters excludes it are likely to meet with general approval.

He believes that mercury, by its tendency to diminish the plasticity of the blood, favours liquid effusion; and, as the best result which can reasonably be expected in pericarditis is adhesion, that this tendency must be directly injurious. While

not disposed to differ with the author's low estimate of the antiphlogistic powers of mercury, we think that all practical experience shows that it possesses very considerable efficacy in the removal of liquid effusion.

There is an excellent chapter on valvular disease of the heart, containing some valuable practical remarks on the prognosis to be made in these affections, as well as on the diagnosis of cardiac murmurs. On one point we are compelled to differ from the author. He states that a mitral systolic murmur is sometimes produced without regurgitation through the valve, "simply in consequence of a thickening of, or a deposit upon, the valve, which giving rise to unequal vibrations, causes a murmur." This opinion he seems to have formed in consequence of having observed cases in which persistent mitral murmurs had existed without any evidence of secondary disturbances of the circulation, either in the lungs or elsewhere.

With our knowledge of how slight an amount of valvular incompetence may cause a murmur, we cannot regard this as a sufficient reason for denying the existence of regurgitation in these cases. Besides, too, it is simply inexplicable how a sound of the character of a murmur could be produced in the manner suggested by the author. Thickenings, both of the mitral and of the aortic valves are very common; in fact, in *post mortem* examinations it is the exception to find these valves in a perfectly healthy condition; and yet a diastolic murmur at the aortic orifice from mere thickening of the semi-lunar valves without regurgitation is absolutely unknown. An inequality in vibration may modify the character of a sound, but that it could generate a bellows murmur is, we think, contrary both to clinical experience and to acoustic principles. Todd was of opinion that a mitral murmur might be developed without regurgitation, but his notion of its production was that it took place when the ventricular aspect of the valve was roughened by deposit, and that it was caused by the passage of the blood over the inequalities thus formed. This view, however, has not been adopted for obvious reasons; indeed, no opinion is more universally entertained among writers on cardiac disease, than that a mitral murmur always signifies regurgitation.

On the subject of mitral diastolic or pre-systolic murmur, the author agrees with the majority of observers as to the infrequency of this sound. In cases of mitral obstruction, he states that murmur is far more frequently absent than present, and he has

observed that it may be absent on one day and present on the next, and *vice versa*, its presence or absence possibly depending on the condition of the auricle as regards its vigour of contraction.

A question of much interest is dealt with in the succeeding chapter, namely, that of *sudden death in heart disease.* The form of cardiac affection most liable to terminate in sudden death, is held to be fatty degeneration. Of valvular diseases, in the experience of the author, about equal numbers of cases of mitral and of aortic disease have terminated suddenly; but he is inclined, on theoretical grounds, to regard mitral disease as that most likely to lead to a suddenly fatal termination. Valvular disease, in his opinion, rarely produces sudden death, unless there is also some weakening or degeneration of the muscular fibre.

Some very interesting cases of aneurism are recorded; in one, the mode of treatment by absolute rest advocated by Mr. Tufnell, of this city, was tried with some advantage. The patient was confined to bed and kept in the horizontal posture for eleven weeks. His diet was restricted to seven ounces of bread, three ounces of meat, and eight ounces of fluid per diem. He was allowed a little ice and one pipe daily. The effect of this treatment was to diminish the size and prominence of the tumour, and apparently to cause a deposit of fibrin in the sac. This was the more remarkable as other means such as ice to the tumour, acetate of lead, &c., had been employed without any good result. The deposit of fibrin, however, occurred only in the anterior part of the sac; the patient returned to his employment, that of a ship watcher, and at the end of seven months after leaving the hospital, died suddenly from rupture of the posterior wall of the aneurism.

The following opinions with regard to the value of alcohol in disease, which are found in the concluding chapter of the book, possess some novelty. After observing on the effects of alcoholic stimulants on the circulating system, as evidenced by increased power of the heart, and diminished frequency of pulse, the author proceeds:—

"But the effects which alcohol produces on the circulation cannot be accounted for, I think, simply on the ground that it acts as a stimulant and tonic to the heart. It has been proved by some physiologists, that the introduction of certain substances into the blood has a tendency to increase the rapidity of the circulation, whilst the introduction of others has a directly opposite effect. Amongst the latter is alcohol; and, according to the observations that have been made, when this substance is

injected into the vessels of a living animal, there is a retardation of the circulating current, apparently from some physical influence which the alcohol produces, either on the blood itself, or on the coats of the vessels, or on both. And I would here remark, that when alcohol is taken into the stomach, although we have evidence of increased action of the heart, this by no means proves that the blood is circulating more rapidly through the capillaries of the body. The very symptoms, indeed, which follow the administration of a small dose of alcohol—namely, a sensation of fulness and heat of skin—and the congestion which ensues when the dose is increased, tend to prove that there is some impediment to the peripheral circulation. Such a state of capillaries must, necessarily, give rise to an increased tension of the arterial system, and a fulness of the pulse; especially when taken in connexion with the effects produced on the heart itself by the action of alcohol.

"It appears to me, that a knowledge of this local action of alcohol on the capillaries, serves to explain, in some measure, the effects which we witness, in certain cases of disease, from its administration."

We may observe, as an instance, if such were necessary, of the danger of theorizing on subjects connected with practical medicine, that it is on precisely contrary grounds to these, that alcohol is recommended in some forms of disease by many of the ablest practical physicians. For example, in typhus, when the maculæ are dark, it is administered with the object of quickening the capillary circulation, and removing the peripheral congestion, objects which its use in many cases undoubtedly attains. We believe that for the present we must be content with the beneficial effects which alcohol so frequently produces without endeavouring to explain what the state of our knowledge does not enable us to, as yet, thoroughly comprehend.

We have by no means exhausted the points of interest in the work, but we have done enough, we hope, to indicate the interesting and important character of its contents, and the ability with which Dr. Waters deals with his subjects. We have only to add that the views of the author on the anatomy of the lung, and on emphysema, are illustrated by nine plates, based on original drawings.

Thesaurus Craniorum. Catalogue of the Skulls of the Various Races of Man in the Collection of JOSEPH BARNARD DAVIS, M.D., F.S.A., &c. London: printed for the Subscribers. 1867.

A MARKED feature in anatomical science, at the present time, is the attention paid to the human skull and its principal varieties,

and the degree of accuracy with which both the individual race characters, and deformities of the cranium are distinguished, the one from the other. The stimulus given to craniology by the researches of Gall and Spurzheim, however erroneous their doctrine may be in detail, has produced its abundant fruit in directing attention to modifications of form and of measurement, which otherwise might have passed unnoticed. The work under notice at present is among the most recent of the contributions to craniological literature, and, coming as it does from the pen of one of the joint authors of *Crania Britannica*, it well deserves a careful study; and, when taken in connexion with the works of Morton and Meigs, of Owen, Huxley, Van der Hœven, and Von Baer, it affords abundant material for the study of craniology. To the ethnologist such a work properly, executed, is a mine of immense value; while to the anatomist it affords a mode of determining the degree of frequency of cranial deformities and of osseous abnormalties; and to the zoologist a catalogue like the present affords the most important evidence on a vexed question, the unity or plurality of race in the human family. Very wisely, Dr. Davis has, in general, avoided any thing but a detail of facts; and he has selected these facts, for the most part, judiciously and well, and this constitutes the great value of the book. The arrangement is geographical, and a very fair representation of the crania of the principal races of the world will be found in the catalogue. The style of the book can be illustrated in the best manner by an example; we will take an instance from p. 128:—

"1.—943. Armenian fem. of considerable age. Calv. D. C.

"A, 67; B, 19·3; C, 14; *a*, 4·6, *b*, 4·7, *c*, 4·7; D, 14·2; E, 6·9; F, 5·1*t*; *a*, 4·2, *b*, 4·8, *c*, 3·9; G, 5·3; *a*, 4·5, *b*, 4·5, *c*, 4; I, 4·8; J, 73; K, 76.

"A long, narrow, regular calvarium of a woman.

"This skull exhibits the *condylus tertius* of J. F. Meckel in the form of a low tubercle in the middle of the anterior edge of the occipital foramen, which has an articular surface for the processus dentatus of the second vertebra."

The very comprehensive series of measurements (which are A, internal capacity; B, circumference; C, fronto-occipital arch, divided into *a*, frontal part; *b*, parietal; *c*, occipital; D, intermastoid arch; E, longitudinal diameter; F, transverse diameter, which may be *t*, temporal, *f*, frontal, or *p*, parietal; *a*, frontal breadth; *b*, parietal breadth; *c*, occipital breadth; G, height, which may be *a*, frontal,

b, parietal, and *c*, occipital; H, length of face; I, breadth of face; J, cephalic index; K, proportion of height to length, the latter taken as 1·00,) show the immense labour which the book entailed; and, whatever faults it may have, every one must agree to regard it as a monument of untiring industry and care.

The anatomical notes given in this volume are of great interest; for example, we learn that in this collection the proportional frequency of occurrence of an open frontal suture is once in twenty-nine instances, a proportion smaller than one would, at first sight, expect; for out of twenty-five skulls, taken at random, in the College of Surgeons' Museum, Dublin, this suture is present in six; possibly, indeed, its existence may not be recorded, in all the skulls of Dr. Davis's collection in which it may exist, or it may be a character commoner in British skulls than in those of aboriginal races, although the catalogue does not favour this idea. Again, we learn that the spheno-parietal suture is absent either on one or both sides in the proportion of one in fifty-eight instances; so that this character, so often remarked as pithecoid, really does occur with a comparative degree of frequency in human skulls. Again, we cannot but be struck with the variety of capacity in the series. "This (measurement) is determined by filling the calvarium with dry and clean Calais sand, the specific gravity of which is 1·425, and then weighing the sand." In one skull, 1045, p. 59, the capacity is given as 56 ounces; in another, 59; in another, 92; in another, 90; in another, 102. In an appendix, on the capacity of skulls, we learn the following singular facts that of the skulls of European races, the Germans, Russians, and Finns, are the largest, and are followed in regular order by the Welsh, Turks, Italians, Swedes, Scotch, Irish, English, whose heads are a little larger than the Lapps, or the ancient Gauls. We learn, also, that the English cranial capacity is likewise inferior to the Siamese or Chinese, to the Kafirs and Zulus, and to many of the Polynesians. Taking the deduction of Welcker that the membranes, blood-vessels, &c., occupy from 11·6 to 14 per cent. of the interior, the former in small skulls, and the proportionate weight increasing, this would indicate the brains of these races as larger than the average British brain. A large brain is not, therefore, necessarily an index of great mental power, a fact sufficiently obvious, even to unprofessional eyes, to justify the vulgar proverb, "big head, little wit;" and, even though Zulus do exceed us in cerebral development, the instances are but few, in which they will succeed in excelling the intellectual and logical capacity of the brain of a Briton.

Of other anatomical features the ossification of the tissue around the basicranial prolongation of the notochord, the third condyle of Halbertsma and Meckel, is noticed as existing once in sixty instances, and the transverse malar suture, described by Sömmerring and Garbiglietti, in three cases in the entire collection. Symmetrical Wormian bones on either side of the frontal occurred in one instance. Another example of this has fallen under our notice. The presence of a single nasal has been recorded in two cases, and the absence of these bones in two others, and the peculiar prolongation of the middle spur of the pterygoid plate backwards and outwards to join the styloid process of the sphenoid bone is noticed in seven instances. This spur is described accurately by Professor Hyrtl, of Vienna, and is mentioned by him as very rare. Its nature is easily understood, as it is merely the normal pterygo-spinous ligament of Civinini ossified. We have met with this anomaly in but one instance, and its degree of frequency would seem from the catalogue to be in the proportion of once in two hundred and seven crania.

The classification of crania is attended with many difficulties, and has been attempted upon different bases, each having features of value. The division into phænozygous and cryptozygous of Busk is useful in determining the lateral extension of the tempora, the former name denoting those skulls whose zygomata are visible when the skull is viewed from above, or in its norma verticalis. The cryptozygous are those whose zygomatic arches are hidden when the skull is examined in the same manner. But the classification proposed by Professor Huxley—(Notes upon the human remains from Keiss in *Laing's Pre-historic Remains of Caithness*, p. 85)—depending on the cephalic index, or the proportion of the breadth to the length, the latter being taken as 1·00, gives us the simplest and clearest ideas of the affinities of crania in general. All those whose cranial index is above ·80 are Brachy-cephalic or short-headed, all below are Dolicho-cephalic. The former are again divided into those at or above ·85, called Brachisto-cephalic, and those from ·85 to ·80, or Eury-cephalic. The Dolicho-cephalic are again grouped into those from ·80 to ·77, sub-Brachy-cephalic; from ·77 to ·74. Ortho-cephalic; from ·74 to ·71, Meco-cephalic; ·71 *et infra*, Mecisto-cephalic.

An important series of anatomical peculiarities in the cranium depends on the premature consolidation or synostosis of some of the sutures, and this has given rise to many deformities, and has been

the subject of many memoirs. On the subject of synostosis all anatomists are by no means agreed; and it is important in a valuable contribution to science like the present to find what place in the controversy is taken by the author. Dr. Davis has already published many of his views on synostosis, in connexion with the the celebrated Neanderthal cranium, whose peculiarities he explains on the ground of premature sutural consolidation, which he regards as a power competent to produce very great variety in cranial form. At the same time he gives in the catalogue fifteen cases of synostosis, of the sagittal and neighbouring suture at comparatively early ages with no deformity, and fifty-seven instances of deformities, the result of premature bony union. There is no doubt that the premature union of two bones can cause some amount of deformity, provided that union puts a period to subsequent extension; but in computing the effects of such unions we must endeavour to ascertain the influence upon bony growth of the original situation of ossific centres. When ossific centres are close together, they have a greater tendency to coalescence than when at a distance, and are usually placed at a greater angle the one from the other. In forty skulls measured by the reviewer, to ascertain the average distances of the centres of the parietal tubera, the one from the other, he found that the maximum distance was seven inches, the minimum an inch and a half; and he also found that the instances of sagittal synostosis presenting deformity had these centres nearer to each other than those examples of synostosis with no deformity or instances of an open suture; and in two Scapho-cephalic crania, evidences of parietal tubera were found placed, each less than three quarters of an inch from the median line. The theory that early synostosis might possibly be a race characteristic was first broached by Dr. Minchin in this Journal, November, 1856, and was supported by Dr. Thurnam (*Nat. Hist. Review*, 1865, p. 242), and Von Baer (*Die Makrokephalen, &c.*, 1860). The first named gentleman directed attention to the description of the Macro-cephali inhabiting the shores of the Euxine, as given by Hippocrates, and suggests that their elongated crania owed this form to a premature (probably fetal) synostosis of the sagittal suture producing a uniparietal bone. Dr. Thurnam has observed that one series of ancient British crania displayed synostosis as a very common character; and he also noticed that in African skulls the same condition was very common. Both these opinions are referred to by Dr. Davis, who

has also given some observations of his own on the same subject. At p. 38, he says: "Synostotic distortions are well known to be abnormal, and afford no support whatever to the hypothesis of Dr. H. Minchin that Scapho-cephalism or Macro-cephalism might be the heritage of the ancient tribe mentioned by Hippocrates, who dwelt on the shores of the Black Sea." And again, he refers to Dr. Thurnam's view at p. 10. How Dr. Davis can reconcile his sweeping denunciation of the abnormalty and non-characteristic nature of Scaphocephalism with his own description, p. 311, is more than one can easily understand; for in that page, describing skull No. 817, Fatean, he says: "This is, perhaps, the finest and most characteristic specimen of that specific type of skull met with among these races, and not to be found in any other part of the world. Its extraordinary length, narrowness, and height are seen by the measurements. * * * Indeed, it indicates the measurements of a Scaphocephalic skull, although the sutures are all patent in this admirable example. *Here Scapho-cephalism becomes as it were a race-character.*" This seems, certainly, to an ordinary reader like a contradiction; but the learned author may, perhaps, have some occult method of reconciliation, by which the two statements may be harmonized. But enough of this.

The anatomical points referred to in the book will thus be seen to present to us many facts of deep interest, well deserving of the attention of all practical anatomists. But the book has another aspect, the ethnological, in which it requires our notice. Dr. Davis is an advocate for the plurality of races, and brings out his belief in many parts of the book; and, as this subject is one fraught with the deepest interest, it would be worth examining the grounds of such an opinion. For this purpose, we cannot do better than make a careful comparison of diverse skulls, upon the data furnished to us by Dr. Davis, in order to see whether the basis of his belief, as given in the book, bear examination.

No.	A	B	C	*a*	*b*	*c*	D	E	F	*a*	*b*	*c*	G	*a*	*b*	*c*	H	I	J	K
98	82·6	21·2	15·	5·	5·2	4·8	15·2	7·5	5·6	4·8	5·1	4·4	5·5	4·9	4·2	4·2	—	—	·74	·73
1228	81·	21·	15 2	5 2	5·	5·	15·3	7·4	5·4	4·7	5·	4·1	5·9	5·	5·1	4·5	--	5·4	·73	·79
840	72·	20·2	14·4	4·8	5·	4·6	14·2	7·2	5·4	4·4	5·1	4·4	5·2	4·6	4·7	4·	4·8	5·4	·75	·72
764	72·	20·1	14·3	4·8	4·8	4·7	14·4	7·	5·4	4·6	5·	4·1	5·3	4·5	4·6	3·7	4·6	5·	·77	·75
1016	70·	20·	14·4	4·6	4·4	5·4	15·	6·9	5·4	4·5	4·6	4·5	5·4	4·6	5·	4·4	—	5·3	·78	·78
116	70·	19·8	14·5	4·7	5·2	4·6	14·1	7.	5·4	4·2	5·2	4·2	5·2	4·3	4·6	4·2	—	5·	·77	·74
1178	73·	20·2	14·6	5·4	5·	4·2	14·2	7·1	5·2	4·4	4·6	5.6	5·1	4·6	4·6	4·1	4·7	5·	·73	·71
599	74·	20·5	14·7	5·2	5·	4·5	14·6	7·1	5·5	4·6	5·3	4·5	5·5	4·7	4·9	4·2	4·8	5·1	·77	·77
15	72·5	20·	14·	4·9	4·5	4·6	14·6	7·	5·5	4·5	5·	4·	5·6	4·5	4·7	3·9	—	5·6	·78	·80
1236	66·	20·3	14·1	4·7	5·	4·4	14·7	7·1	5·3	4·5	4·7	4·3	5·3	4·5	4·8	4·	—	5·2	·74	.74

In this table, which consists of examples taken nearly at random, at least selected with very little care, it will be seen that the first and second bear a closer relationship to each other in most respects than to any of the others, the differences being but 1·6 in capacity, ·2 in circumference, &c.; and yet, 98 is the cranium of an ancient Briton, and 1228 is the skull of an inhabitant of Dahomey. Again 840 and 764 present no differences of importance in dimensions, and the former is the skull of a female Canadian Mississaga Indian, and the latter is that of a Scottish female. The third pair are, respectively, the skulls of an Englishman and a Chinaman from Ningpo. The crania of the fourth pair are 1178, the skull of an Italian, and 599, a Polynesian, from the Island of Uahuga, of the Marquesas group. No. 15, a Maori, resembles closely 764 and 840; while 1230 does not resemble 1228, although both are the skulls of Dahomans.

There is no intelligent man who has ever devoted even a short time to the examination of a collection of skulls of different nations but who has come to the conclusion that there are great general features which are characteristic of the leading divisions of the human race, but a close study will convince any one possessed of an average reasoning capacity, that between the crania of every group and its neighbours, links intermediate occur so numerously as to preclude the possibility of drawing strong lines of demarcation between the various tribes, for the differences between the skulls of the most diverse races of mankind are not nearly as great in degree as the differences between the crania of a King Charles spaniel and that of a mastiff or a greyhound. The principle which Mr. Darwin has so fully illustrated that one species is subject to variation when influenced by external causes, is one which we cannot help applying to the human race, for in it we have a striking exemplification of the great law of nature, unity in variety. A careful examination of the measurements in this book will lead any unprejudiced observer to the conclusion that, whatever evidences may be afforded by collateral sciences in favour of the multiplicity of species in the human family, the examination of skulls gives to us proof of nothing beyond the variation which we would be prepared to meet with in the bony skeleton of individuals of one species.

Many other interesting points are touched on in this comprehensive volume. The influence of Micro-cephaly upon the moral faculties is referred to in several places, in connexion with the skulls of

convicts. The work is illustrated with numerous expressive woodcuts, which enhance its value very considerably; and, on the whole, it may be regarded as a most valuable contribution to literature, which should be in the library of every anatomist, ethnologist, or zoologist.

WORKS ON DIGESTION.

1. *A Treatise on the Function of Digestion; its Disorders, and their Treatment.* By F. W. Pavy, M.D., F.R.S.; Fellow of the Royal College of Physicians; Senior Assistant-Physician to, and Lecturer on Physiology at, Guy's Hospital. London: John Churchill and Sons, New Burlington-street. 1867.

2. *On the Diagnosis and Treatment of the Varieties of Dyspepsia Considered in Relation to the Pathological Origin of the Different Forms of Indigestion.* By Wilson Fox, M.D., Lond.; F.R.C.P., &c. Second edition. London: Macmillan. 1867.

Dr. Pavy's work will be read with interest both by the physiologist and the physician. It contains an excellent and very complete summary of the state of our knowledge regarding the physiology of digestion. To this subject the author has himself made important contributions, and the present volume contains a considerable amount of original matter, the fruit of his own observation and experiments.

The portions of the work devoted to the derangements of digestion are not so full as those which treat of the normal process, nor is there much that is novel contained in them; but the descriptions of symptoms are clear and concise, and the remarks on treatment judicious. The basis of the treatise being physiological, the functional derangements of the digestive process are considered in connexion with the normal operations from which they are departures. The titles of the different sections will give a clear idea of the scope and arrangement of the work. They are as follow:—Prehension and Ingestion; Mastication; Insalivation; Deglutition; Difficulty of Swallowing, or Dysphagia; Gastric Digestion; Vomiting; Eructation—Rumination; Perverted Appetite; Pain and other Morbid Sensations connected with the Stomach; Flatulence; Heartburn; Water-brash; Acidity; Intestinal Digestion; Colic—Enteralgia; Intestinal Flatulence—Tympanites; Diarrhea; Constipation.

Structural changes in the digestive organs are not described, and the author expresses this opinion, that pathology has thrown little light upon digestive disturbances—an opinion which we venture to hope the progress of investigation will soon render no longer tenable, and which even already the researches of Handfield Jones, Fenwick, and the author of the other work named at the beginning of this article, as well as those of other observers, have gone some way to disprove.

Gastric Digestion is treated at some length, and the section devoted to it contains several observations of considerable importance. With reference to the value of pepsine—an agent now extensively employed in the treatment of some forms of indigestion—the author is very sceptical. He states that it is found in abundance in the stomachs of persons who have died even from protracted disease of different kinds—a fact which, if it be established, would point to the conclusion that it is not owing to a deficiency of this principle that the impaired condition of the digestion found in these affections is owing, and which suggests serious doubts as to its therapeutical efficacy in many of the cases in which it is usually administered. The stomachs examined were from subjects in whom the causes of death had been so widely different, as typhoid fever, phthisis, apoplexy, lardaceous disease, lithotomy, ovarian disease, and heart disease, with typhoid symptoms. On the other hand, we may remark, the observations of Fenwick, detailed in his recent work on the stomach and duodenum, and which were made with special reference to this point, are in direct opposition to the results obtained by Dr. Pavy. Fenwick found that the amount of pepsine, estimated by its solvent power on albumen, was much diminished in several instances of disease; for example, in heart disease, accompanied by congestion of the gastric mucous membrane, and in cancer. The whole subject of the formation of this organic principle and of the conditions which modify its quantity and quality, requires further investigation.

With regard to the quality of the pepsine which is used for medical purposes, we find the following observations:—

"Seeing that pepsine happens to be always present in the mucous layer at the surface of the stomach, doubts may not unreasonably be entertained regarding the utility of, or the reality of any assistance to be derived from its administration. It may be admitted, however, as possible that in some cases the pepsine in the stomach may be deficient in quantity or defective in quality, and that service may be derived from its

administration with the food: but for this to be the case, it stands to reason that the pepsine employed must be in an effective condition. Now, speaking from the examination of several specimens of pepsine procured from some of the largest pharmaceutical establishments in London, the bulk of that which is sold is totally devoid of any active property. Whether this arises from too much heat having been employed in its preparation, or from whatever cause, the fact remains that the chief portion of the pepsine sold and administered, being perfectly inert as a digestive principle, is destitute of any real value as an agent for affording assistance towards the performance of digestion. Whatever benefit, therefore, has seemed to accrue from the employment of such a preparation, must have arisen from its influence on the mind rather than on the process of digestion."[a]

The interesting question of why the stomach is not itself digested by the fluids which it contains, while substances of a composition identical with its own are rapidly acted on when introduced into its cavity, is discussed with much ability, and some highly interesting experiments of the author are detailed.

It is well known that Hunter attributed the immunity possessed by the walls of the stomach during life to the influence of what he called "the living principle." He regarded the extinction of this living principle at death as the cause of the *post mortem* solution of the stomach which is so often observed, and believed that if a portion of a living animal—the hand, for instance—while still in organic connexion with the body, could be introduced into the stomach of another animal during digestion, there would not be any effect produced on it by the gastric juice. This notion of Hunter was brought to the test of direct experiment by Bernard, and found to be altogether fallacious. Bernard introduced, and the experiment has been repeated with similar results by Dr. Pavy, the hind legs of a living frog into the stomach of a dog while digestion was going on in the latter, and found that the tissues of the frog yielded to the action of the gastric juice, and were dissolved by it, although the animal remained alive. An experiment of a kindred nature has also been performed by Pavy, in which the ear of a rabbit was substituted for the frog, and with the same result, a portion of the ear being almost entirely removed by the solvent action of the gastric juice.

[a] In the "Gulstonian Lectures," vide "Lancet," April 25th, 1863, I mentioned the sources from whence I obtained the specimens of pepsine referred to. It is but justice to state that Messrs. Bullock and Reynolds' pig pepsine was found to possess very active properties.

The explanation offered by Bernard to account for the immunity of the stomach is regarded by Dr. Pavy as unsatisfactory and insufficient. Bernard's opinion is that the protection is afforded by the constant renewal of the epithelium, which covers the stomach; and that when death takes place the solution of the stomach, which then frequently occurs, is owing to the non-renewal of this protecting layer. The following remarks are made by the author on this question:—

"Experiment shows that the explanation which refers the escape of the stomach from destruction by its own secretion during life to a protective influence exerted by its epithelial layer, will no more stand investigation than the 'living principle.' I have found ('On the Immunity enjoyed by the Stomach from being digested by its own Secretion during Life,' 'Transactions of the Royal Society,' 1863) that the excision of a patch of mucous membrane from the stomach of a living animal is not followed by digestion of the subjacent parts, and thence perforation—phenomena that would be looked for if the protection were owing to the epithelial layer. Digestion goes on in such a stomach without the structures opposite the denuded part exhibiting any evidence of attack. The walls here evince no signs whatever of enjoying less security than elsewhere; and on the animal being allowed to live, I have found that repair by cicatrization has ultimately completely taken place.

"Independently of the evidence afforded by experiment, it may be assumed, upon reflection, that something more constant—some condition presenting less exposure to the chance of being influenced by external circumstances—than that resting upon the existence of an epithelial covering, is required to account for the remarkable security from destruction by its own secretion which the stomach is found to enjoy during life. From the position the stomach occupies as a receptacle for everything that may chance to get swallowed, it can hardly escape having its mucous membrane occasionally abraded; and yet its integrity is found to be maintained. Ulceration of the stomach, also, is not of uncommon occurrence; but it does not necessarily lead to perforation as a result. Perforation, it is true, does sometimes occur as a consequence of ulceration; but the same event is noticeable in the case of other parts of the alimentary tract, and there is no reason to regard it in the stomach, more than elsewhere, as due to anything besides the ordinary progress of the ulcerative process."

The theory advocated by the author in the following quotation is open to some obvious objections, but is certainly highly ingenious. It affords a plausible explanation of the difficulty which

has puzzled so many physiologists, and it has been favourably received by many competent authorities:—

"The question, it must be considered, then, as to how it happens that the stomach, composed as it is of digestible materials, escapes during life being digested itself whilst digestion is being carried on in its interior, still remains, as far as the explanations already referred to are concerned, an open one for solution. It is evident, upon consideration, that whatever explanation claiming any pretensions to sufficiency is given must comprise some broad principle of action capable of providing against all contingencies—capable of affording, in fact, that uninterrupted security during life which, upon looking around us, we observe the stomach to enjoy.

"The view that I have offered ('Philos. Trans.,' 1863) is founded upon the permeation of the walls of the stomach by an alkaline current of blood; and this agrees with the principle I have laid down as indispensable, for the circulation of blood forms with us one of the essential conditions of life. It will not be disputed that the existence of acidity constitutes a necessary condition for the accomplishment of gastric digestion. Alkalinity is also a constant character of the blood. Now, the walls of the stomach being everywhere permeated by a current of alkaline blood, an opposing influence is raised to the occurrence of digestion. The gastric juice, it may be considered, is constantly tending to penetrate and act upon the stomach, as well as upon the food contained in its cavity; but attack upon the stomach is prevented by the destruction of solvent power that is induced by the neutralizing influence exerted by the current of alkaline blood which happens to be always flowing through the gastric walls during life.

"This view will be found to be perfectly reconcilable with the yielding of the stomach to the digestive influence of its secretion that is noticed to occur after death. As death takes place, the circulation is stopped, and the protecting influence is lost that it afforded during life. There is only the blood that is stagnant in the vessels to exert a neutralizing effect; and should death happen to take place at a period of digestion, the neutralizing capacity of this will be altogether inadequate to prevent the gastric juice that is present attacking the stomach as well as its contents. Digestion of both stomach and its contents proceeds as long as the temperature is kept up to a suitable degree for the purpose, and the solvent power of the gastric juice remains unexhausted.

"In the special arrangement of the vascular distribution that is found to exist in the mucous membrane of the stomach, security, according to the view I have propounded, seems to have been rendered, as it were, doubly secure by the doubly effective barrier that may be said to have been provided against the progress of digestion. At the surface of the

stomach there exists a closely-woven plexus of capacious capillaries, which, as has been previously pointed out, derive their blood, not from arteries, but from the capillaries which course upwards between the gastric tubules. Now, it is from the blood circulating in the capillaries between the tubules that the acid constituent of the gastric juice is drawn; and it follows, therefore, that in proportion as acid is separated here, the blood circulating in the capillaries at the surface must be correspondingly increased in alkalinity. Thus, it will be remarked, not only is the alkalinity of the blood greatest just where alkalinity is most wanted for its protecting influence—viz., at the surface—but in proportion as acid flows into the stomach and creates a demand for a protecting influence, so is the blood circulating at the surface rendered more alkaline, and thereby more efficacious as a protecting medium. Looking at nature's arrangement, the act creating a demand for the exercise of neutralizing action enhances the character of the neutralizing capacity provided."

Besides these considerations, direct experiments are brought forward as tending to establish this view. The author has found that solution and perforation of the stomach may be brought about during life by arresting the circulation in the stomach, or by pinching up and ligaturing a portion of its walls so as to cause the constricted portion to project into the cavity of the organ. The objections to the theory propounded are also noticed with candour, and fairly discussed. Indeed, the entire chapter deserves the careful study of all interested in this difficult and much-discussed problem. Intestinal digestion is the subject of an article of some length, and the functions of the liver and pancreas are detailed with much completeness.

A suggestion regarding the production of an article of food for invalids, by having meat artificially digested before it is taken, seems to us to possess some practical value. The author has succeeded by means of the action of a mixture of pepsine and hydrochloric acid on meat in producing an extract which equals about the third of the weight of the meat employed in its preparation, and in which the nitrogenized alimentary principles are dissolved, and are, besides, rendered diffusible, so as to be capable of being readily absorbed into the system. An analogous process has also been recommended by Dr. Marcet, and it seems likely, if the product can be rendered sufficiently palatable to be taken without repugnance by invalids, to be of real advantage in cases of weak digestion.

We can heartily recommend this work as giving a clear, simple,

and thoroughly scientific account of the subject of which it treats, to everyone who wishes to become familiar with the latest advances in the physiology of digestion.

In the work which stands next on our list, and which has rapidly reached a second edition, Dr. Wilson Fox examines the subject of dyspepsia from an altogether different point of view. He groups together all the forms of indigestion under three great heads:—

1. Atonic dyspepsia.
2. Neuroses of the stomach.
3. Inflammatory dyspepsia, or gastric catarrh, which may be either acute or chronic.

Much stress is justly laid on the frequency with which abnormal conditions of structure are met with in cases of indigestion. There can be no doubt that morbid changes of the stomach have been and are often overlooked in *post mortem* examinations. This arises partly from the difficulties which are inseparable from the examination of an organ which is specially liable to *post mortem* changes; partly from the fact that careful microscopical investigation is, in many cases at least, necessary for the determination of the nature of its alterations—a process which requires an amount of time and skill not generally available; and in a great measure, also, from the few opportunities which pathologists can obtain of examining the condition of the stomach in minor forms of disease. Observations on the subject are, nevertheless, beginning to multiply, and there is reasonable ground for the expectation that the catalogue of functional disorders of the stomach will ultimately undergo the same process of abbreviation which has already taken place in the case of so many other organs.

The whole tendency of recent observation has been steadily in this direction, and the present work contains the results of numerous investigations, which go some way towards the establishing of a more accurate and more extended knowledge of the pathological changes which occur in this organ. In this regard we look upon the volume as possessing much value. The descriptions and illustrations of diseased states which it contains will be found to be replete with interest to those who have studied the morbid anatomy of the stomach. Dr. Wilson Fox had himself previously published some important contributions to this subject, and he has availed himself fully of the labours of his fellow-workers in the same field.

Of the etiology, symptomatology, diagnosis, and treatment of dyspepsia, we have a very full and elaborate account. Indeed, some points are treated with an almost superfluous amount of detail, and with, perhaps, a slight tendency to over-refinement. Students, however, seeking a guide through the intricacies of this most complicated and difficult branch of medicine will not object to this; and they will derive advantage from the multiplied references to authorities which will enable them to form an idea of the mass of works which treat of stomachic diseases, and of the immense industry and research which Dr. Wilson Fox has devoted to the study of the literature of the subject.

We cannot avoid a reference to a point of some practical importance with regard to diet, in which Dr. Wilson Fox seems to us to have fallen into a serious error. He states (p. 102) that starchy foods are objectionable in cases where pyrexia is present, because the secretion of saliva is much diminished, and consequently the starch passes unchanged into the stomach, and is not only useless for nutrition, but by undergoing the acetous or lactic fermentation, may become injurious. This observation, into which he seems to have been led by a misapprehension of some remarks made by Dr. T. K. Chambers, is, in our opinion, altogether erroneous. The experience of every physician, as well as the instinct of patients, is strongly in favour of the value of these foods in the condition alluded to. A cup of thin arrow-root, or some kindred article of diet, is certainly not only agreeable, but, as far as the sensations of the patient can be taken as a guide, highly useful in cases of pyrexia, and in our experience its administration has not been followed by any prejudicial results. But even from a physiological point of view Dr. Wilson Fox's statement is curiously contrary to the fact. Not to mention that the secretion of gastric juice is diminished as well as that of saliva, so that on this ground albuminous foods also might be forbidden, it has been found that the digestion of starch can be thoroughly accomplished in the small intestine, the pancreatic secretion possessing even greater power than the saliva of converting starch into sugar. Again, chemically, it is not possible that starch can undergo either the acetous or the lactic fermentation without having been previously rendered soluble, and consequently capable of being easily absorbed into the system. Indeed, we may go further, and say that it must actually be converted into sugar. This change, which is precisely that brought about by the action of the saliva, being,

as far as we know, an essential preliminary to the further changes which take place during the process of fermentation.

We have alluded to this point because it is one of much practical interest, and because the generally judicious character of the recommendations of Dr. Wilson Fox on the subject of treatment makes this oversight the more remarkable.

We have said enough, even in this short notice, to show the high opinion which we entertain of the merit of the work, and of the learning and acuteness displayed by the author.

On the Physiological Action of the Calabar Bean (Physostigma Venenosum, Balf.) By THOMAS R. FRASER M.D., Assistant to the Professor of Materia Medica in the University of Edinburgh. 4to, pp. 73. Edinburgh: 1867.

THIS large tractate was read before the Royal Society of Edinburgh on the 17th of December, 1866, and it forms Art. XLVIII. of the Transactions of the Society for that year.

In 1862 Dr. Fraser wrote a graduation thesis on the "Characters, Actions, and Therapeutic Uses of the Ordeal Bean of Calabar," and states that the principal results which he obtained at that time were that this substance causes death by either syncope or asphyxia, the latter being due to an effect on the spinal cord and the respiratory centres; that the symptoms resemble those of cardiac or pulmonary embarrassment, according to the quantity of the poison administered, and to its rate of absorption; and, also, that the topical application of this agent to the eyeball, or to its neighbourhood, produces a marked and rapid contraction of the pupil, and various disturbances of vision. "The present investigation" (writes Dr. Fraser) "was undertaken for the purpose of extending and supporting my previous results, with some of which subsequent observers have disagreed." The effects which follow the topical application to the eyeball are "merely alluded to in this paper, as this portion of the subject has not been completed."

With few exceptions the experiments recorded in this volume—and they were so many as 103—were made with the common frog, birds, and various mammals. Fatal results were produced on birds with the smallest quantity, while the largest doses, in proportion to weight, were required to kill amphibia. "A dose of one-sixteenth

of a grain proved rapidly fatal to a pigeon weighing nine ounces and three quarters; whereas a frog, which weighed 726 grains, has recovered from three grains of extract—a quantity sufficient to produce death in a dog of average size." The first experiment was made on a healthy dog, with the result of proving that prolonged digestion with gastric juice does not impair the energy of Calabar bean. It is thus described on page 3:—

"A gastric fistula was formed in a healthy dog, and, some days afterwards, and while the animal was in good health, 500 grains of gastric juice were withdrawn from the stomach. Four hundred grains of this were mixed with half a grain of extract of physostigma, received in a flask with an arrangement to impede evaporation, and placed in a water-oven at a temperature of 98° F. The digestion was continued for twenty-four hours, when the fluid was placed in a capsule and evaporated at 85° F. The resulting extract was finely pulverized, heated with alcohol of 85 per cent., filtered, and again evaporated to dryness. Contact with distilled water removed an acid fluid, which was made alkaline by excess of magnesia, and agitated in a bottle with chloroform. The chloroformic solution was removed by a separating funnel and evaporated, and the resulting brown extract was suspended in distilled water. A drop of this was applied to the conjunctiva over the right eyeball of a rabbit, whose pupil, before the experiment, measured $\frac{15}{50}$ths × $\frac{15}{50}$ths of an inch. In eight minutes, the pupil was $\frac{8}{50}$ths × $\frac{12}{50}$ths; in fifteen minutes, $\frac{6}{50}$ths × $\frac{8}{50}$ths; in twenty minutes, $\frac{4}{50}$ths × $\frac{5}{50}$ths, and it continued in this contracted condition for many hours. The remainder of the fluid was injected under the skin of a young pigeon, and caused its death in eight minutes.

"Several small pieces of hard-boiled white of egg were placed in a flask with the remaining 100 grains of gastric juice, and digested under exactly the same conditions, and at the same time, as the extract of physostigma. They were found to be completely dissolved in less than ten hours. There could, therefore, be no doubt as to the activity of the gastric juice which had been employed."

The following is an abstract of some of Dr. Fraser's principal conclusions as to the action of this poison through the blood:—

1. Physostigma has proved fatal to every animal hitherto examined, with the exception of the Esĕrĕ moth.

2. The contact of the extract with the gastric juice of a dog, for twenty-four hours and at a temperature a little above 95° F., did not modify the energy of the poison.

3. A large dose, given to a mammal or bird, rapidly affects the

cardiac contractions, and then paralyses the heart. The respiratory movements are quickly stopped, but the symptoms and *post mortem* appearances are those of syncope. Such a dose, injected into the abdominal cavity of a frog, affects nearly simultaneously the heart and spinal cord, and very rapidly destroys the vitality of both organs.

4. In mammals and birds, an average dose produces symptoms of asphyxia. When administered to frogs, a similar dose impairs the function of the spinal cord, and diminishes the rates of the cardiac contractions and of the respiratory movements; and, soon after, the latter cease.

5. When a small dose is administered to a frog, the effects are the same as those in the previous conclusion, until they arrive at the stage of paralysis of the motor nerves; after this, an interval of several hours may elapse before the functions of the spinal cord are completely suspended. During this interval the *tactile* sensibility of the afferent nerves is increased.

6. *With a smaller dose, a frog may have its cardiac contractions reduced by from seventy to eight per minute, its respiratory movements completely stopped, and the endorgans of its motor nerves paralysed, and yet afterwards completely recover.*

7. In frogs, the voluntary muscles are unaffected by the poison, and may continue to respond to galvanic stimulation during three or four days after its administration.

8. In mammals and birds, the voluntary muscles are affected in a very remarkable manner. At an early stage of the poisoning, faint twitches occur, which gradually extend over the body, and, at the same time, increase in vigour so as to interfere with the respiratory movements. Shortly before death, they again become mere successive twitches, often requiring the use of the hand to discover their existence. After death, if a muscular surface be exposed, these twitches will still be observed, involving usually different muscular fasciculi at different times, rarely the whole of a muscle at once; and in mammals they may persist for more than thirty minutes after death.

9. In mammals and birds, when the dose is large, the heart's action is rapidly made slower and then stopped. In dogs, it may diminish to one-half in three minutes, and cease in ten. In frogs also, a large dose, injected into the abdominal cavity, causes rapid and complete cardiac paralysis.

10. The pneumo-gastric nerves retain their inhibitory power over the heart during the whole time from the diminution to the partial recovery of its action.

11. Division of the pneumo-gastric nerves, or their paralysis by curare, or destruction of the medulla oblongata or spinalis, does not protect the heart from the action of physostigma.

12. The lymphatic hearts of frogs poisoned by Calabar bean soon cease to contract.

13. In rabbits, a large dose paralyses the cervical sympathetic nerves, before the death of the animal.

20. The pupil contracts in all cases of rapid poisoning in mammalians and birds.

21. Calabar bean acts as an excitant of the secretory system.

24. Congestion of internal organs occasionally occurs; but this is by no means an invariable consequence of a fatal dose.

25. The blood is generally dark after death, but becomes arterialized on exposure to the air; its respiratory capabilities are unaltered; it often clots loosely and imperfectly; and, when examined with the spectroscope, the bands of scarlet cruorine are found unchanged.

The paper ends with the following conclusions as to the topical effects of the Calabar bean:—

B. TOPICAL EFFECTS.

1. " When the poison is applied to the surface of a frog's brain, no effect is produced; but when it is brought into contact with the spinal cord, a few twitches occur in the extremities, followed by paralysis of the portion of cord acted upon.

2. " When physostigma is applied to a mixed nerve-trunk, in a concentrated form and with proper precautions to prevent absorption by neighbouring parts, first the afferent nerve-fibres are paralysed, and afterwards the efferent.

3. " Topical application destroys the contractility of striped and of unstriped muscular fibre. The heart's action is stopped by repeated application to its external surface or to the pericardium. If a small quantity be injected into one of its chambers, paralysis nearly immediately follows.

4. " The blood-vessels are dilated when a solution is applied to the web of the frog's foot.

5. " The effects of the application of Calabar bean to the eyeball are a somewhat painful sensation of tension in the ciliary region, contraction of the pupil, myopia, and astigmatism; with, frequently, congestion of the conjunctival vessels, pain in the supra-orbital region, and twitches of the orbicularis palpebrarum muscle."

There is a large amount of minute information in this paper, and much that is curious as well as useful. We must not, however, forget that for the first accurate description of the effects produced by this medicine we are indebted to Professor Christison, who not only examined into its effects on animals, but also on his own person.

The use of the Calabar bean in cholera is yet *sub judice*, but its use in producing contraction of the pupil is an established fact, for which we are indebted to Dr. Fraser and others.

In a few words, Professor Macnamara has thus summed up the state of our knowledge of the effects of this medicine:—"We may accept it as proved that Calabar bean paralyses striped and unstriped muscular fibre; causes dilatation of the blood-vessels; augments the secretions, more especially those of the mucous alimentary glands; contracts the pupils, and in its action is antagonistic to strychnia; in fact, in all these respects it seems to modify the activity of the vaso-motor nervous system."

Le Monde de la Mer. Par ALFRED FREDOL. Illustré de 22 Planches en couleur, de 14 Planches en noir tirées a part, et de 320 Vignettes Intercalées dans le texte. 2me edition. Paris : Hachette et Cie., 1860. Royal, 8vo, pp. 693.

THE preface to this book states that it is the posthumous work of one whose career had been consecrated to scientific research. The author it is said proposed, as a relaxation from his studies, to popularize the science he had cultivated with love, and which was the great passion of his life; and he collected into a natural history, without a barbarous nomenclature, without scientific pretension, without repulsive anatomy, a considerable number of interesting facts and new observations. Struck with admiration at the sight of the *tableau grandiose* of the ocean, touched by the wonderful spectacle of the life of the waters, the author paints the world of the sea in its pomp and its agitations. He describes the living beings poetically and with originality; he shows their developments and metamorphoses, their skill and their industries, their combats and their loves. He dwells on the products of the sea, on the abundance of its fruits, on the utility of its cultivation; at times he descends into the description of organisms, and makes us "admire both the magnificence of execution and the simplicity of design."

This is a very accurate description of the book before us. It is calculated to make the study of natural history popular and attractive. It is written in clear, elegant, and flowing language, and is most abundantly illustrated by some of the most beautifully executed plain and coloured drawings we have ever seen. We cordially commend it to both young and old, to the student and to

the amateur. The illustrations are worth the price of the book, and fit it to be an elegant drawing-room ornament; and the descriptions of the sea and its inhabitants will give an interest in them that will conduce to and lighten the careful study of scientific manuals.

Elements of Chemistry, Theoretical and Practical. By WILLIAM ALLEN MILLER, M.D., LL.D.; Treasurer and Vice-President of the Royal Society; Professor of Chemistry in King's College, London, &c. Part I.—*Chemical Physics.* 643 pages. Part II.—*Inorganic Chemistry.* 884 pages. Part III.—*Organic Chemistry.* 1,012 pages. London: Longmans, Green, Reader, and Dyer. 1867 and 1868.

IT has often been made a subject of reproach to the scientific men of these countries that they have so seldom produced large and comprehensive works on science. The magnificent cyclopedias, dictionaries, and treatises on chemistry, botany, and other experimental and natural sciences issued so frequently from the press of Germany and of France contrast strikingly with the petty works on the same subjects published in the English language. In medical science the case is different. There are numerous works on medicine and surgery, the production of British writers, which are not excelled in the medical literature of the Continent. It is probable that the reason why there are so few of the larger systematic treatises on the natural and experimental sciences issued from the British press is simply the want of a sufficient number of readers. There are, amongst the cultivators of every department of knowledge, Englishmen, Irishmen, and Scotchmen, capable of efficiently writing the most comprehensive works on the particular sciences or arts to which they are devoted; but there are not, as a general rule, sufficient numbers of Englishmen, Irishmen, and Scotchmen, who, by purchasing such books, would render the labours of their authors pecuniarily successful. Just in proportion as the demand for information on any subject increases, so will the means of instruction in that particular subject become more enlarged and more accurate. Within the last twenty years the cultivation of chemistry has received a remarkable development in these countries. The Chemical Society of London has become one of the largest and most distinguished of the scientific institutions of the metropolis.

More than twenty periodicals devote a considerable portion of their space to the consideration of chemical subjects; and a weekly paper is wholly occupied with "chemical news." The increase in the numbers of those who wholly or partially occupy themselves with chemical pursuits has, of course, reacted on the literature of the science, which is now rapidly assuming a respectable status. A magnificent Dictionary of Chemistry is passing through the press, which might vie with any foreign encyclopedia; and we have before us three large volumes, entitled the *Elements of Chemistry*, in which, however, there is a good deal more than the elementary facts of chemical science set forth.

Dr. Miller's *Chemistry* is a work of which the author has every reason to feel proud, and which we are certain that his publisher must find very satisfactory, a new edition being called for and eagerly purchased every third year since the first publication of the work in 1855. It is now by far the largest and most accurately written treatise on chemistry in the English language; and, excepting in the department of analysis, it contains more information relative to that science than most medical practitioners and students ever require to learn. Part I. (which comprises a volume) is wholly devoted to chemical physics, the major portion being occupied with those departments of physics of most interest to the chemist—namely, molecular forces, physical conditions of matter, chrystallography, double refraction and polarization of light, temperature, and specific and latent heat. All of these important subjects are treated with a copiousness of matter and clearness of style that leave nothing to be desired. In the second volume, the properties of the elementary bodies, and of their inorganic combinations are fully described, and the most recent information relative to them given. Indeed, in this and the other parts of his work the author has proved the extent of his reading by the immense number of his references to the most recent investigations of both British and foreign chemists and physicists. The work may, therefore, be fairly regarded as a faithful mirror from which is reflected the present aspect of chemistry and the cognate sciences. In the third part, or volume—which is also the largest—the important department of organic chemistry is almost exhaustively treated.

In the present edition of Miller's *Chemistry*, the unitary system of notation is adopted—partly, in part II.; wholly in parts I. and III. In order, therefore, to make effective use of this work, the reader must be acquainted with Gerhardt's nomenclature and notation,

and discard from his mind the older modes. We fear, however, that the medical practitioner who "took out" his chemistry ten to thirty years ago will not, as a rule, care to spend his time in learning the new language of the science. For the accommodation of this class of his readers—who, we trust, are by no means few—we almost regret that Dr. Miller did not retain the use of the barred letters employed in the third edition to denote the doubling of the atomic weights of those elements, such as oxygen, the so-called equivalents of which had been increased two-fold. However, as changes that are really desirable must be made sooner or later, it is, perhaps, as well that Dr. Miller has now wholly and exclusively adopted the new system, however it may puzzle some of his readers to know what *dihydric tetra thionate* means, though they may possibly divine that *calcic sulphate* is simply sulphate of lime.

Principles of Chemistry, founded on Modern Theories. By A. NAQUET, Professeur Agregé a la Faculté de Médecine de Paris. Translated from the Second Edition, by WILLIAM CORTIS; Revised by THOMAS STEVENSON, M.D., London. Henry Renshaw, 356, Strand, London. 1868. 848 pages.

THIS is one of the most remarkable works on experimental science which we have seen for a long time. It is essentially an exposition and defence of those modern theories of chemistry so ably propounded by Gerhardt and his followers, and which are now gradually but surely gaining acceptance wherever the science is cultivated. Although these modern theories were first proposed in France, it is remarkable that the French chemists were the last to adopt them. In these countries the unitary system of notation has been for a few years past generally, if not universally, employed by writers of original memoirs, contributed to the purely scientific journals. It is now used by some of the educational bodies who hold examinations in this science; and the majority of teachers have adopted it. In all the works on chemistry that have recently been published the new nomenclature and notation are either partially or exclusively employed. In Germany, and even in Italy, the old theories have, as a rule, been supplanted by the new. France has hitherto, notwithstanding its revolutionary tendencies, adhered closely to the *old regime*. Three or four years ago, one of the most distinguished of

the French chemists, M. Wurtz, produced a remarkable work, entitled *Leçons de Philosophiè Chèmique*, in which he strongly advocated the general adoption of Gerhardt's views, with those necessary modifications which the remarkable advance in organic chemistry during the last ten years had rendered necessary. M. Naquet's work is intended to popularize a knowledge of the new theories of chemistry amongst those classes of students to whom the high price of Wurtz's work renders it a sealed volume. Naquet's chemistry is, therefore, not merely an explanation and vindication of the new views relative to the constitution of chemical substances—it is also an ordinary manual in which the students of medicine will find more practical information than the great majority of them will probably find time to store their minds with. At the same time it is evident that the great merit of this work lies in the purely theoretical parts, in which respect it will be found more novel, and, perhaps, more useful than any other book in an English garb.

Those who doubt the value of an esoteric method of teaching chemical science, could hardly read Naquet's work, with an unprejudiced eye, and remain unconverted to his views. His reasoning is so cogent, his deductions are so well sustained on facts, and his arguments are so convincing, that he cannot fail to carry his reader with him. We believe that his book will mainly contribute to revolutionize the method of teaching chemistry in the educational institutions of France, and it will probably help to convince the few British chemists who still pin their faith to the old theories that the modern ones are more rational and simple.

In this work we find perfectly refuted the argument which those who oppose the new notation have most effectively employed against it—namely, that it assumes the creation of hundreds, indeed, thousands, of substances, not one of which has been isolated. For example, sulphuric acid, SO_3, and potash, KO, have each an independent existence, and when they combine the body which results from their union is termed sulphate of potash, KO, SO_3. According to the new notation this latter body is termed sulphate of *potassium*, and its formula is written $K_2\ SO_4$—the atomic weight of sulphur and oxygen being doubled. It is not, however, necessary to assume that any such body as SO_4 exists. Sulphuric acid in its ordinary state is composed of $SO_4\ H_2$. It is a dibasic acid, and its atomic constitution is best shown by the following formula:—

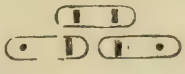
$\left(SO^2 \begin{Bmatrix} OH \\ OH \end{Bmatrix}\right)$. Bases are hydrates of metals (simple radicles), or of

compound radicles; and both simple and compound radicles are basyles. Potash is, therefore, the *hydrate of* (the basyle) *potassium*, and *not* the *oxide* of that metal. All acids contain hydrogen, which admits of being wholly or partially replaced by atoms of other basyles—metals. When half the hydrogen of sulphuric dihydride (sulphuric acid) is replaced by a metal, the resultant salt is acid; and when the whole of the hydrogen is replaced by a metal, the salt is neutral. Thus, the action of potash on sulphuric dihydride produces sulphate of potassium—$\left(SO^2 \begin{Bmatrix} OK \\ OK \end{Bmatrix}\right)$ and bisulphate of potassium—$\left(SO^2 \begin{Bmatrix} OK \\ OH \end{Bmatrix}\right)$ in neither of which the existence of any such body as SO^4 is assumed. In the same way we may describe the constitution of other salts that are not acid, such as, for example, the alkaline carbonate of potassium—$\left(\begin{matrix} CO \\ K \end{matrix}\right\} O^2\Big)$ and the bicarbonate of potassium—$\left(\begin{matrix} CO \\ K \\ H \end{matrix}\right\} O^2\Big)$

In Naquet's chemistry we find, for the first time, largely employed the admirable diagrams, constructed by Kékulé, for the purpose of explaining, in a mechanical manner, so to speak, the modes by which the atoms of matter are arranged in molecules. For example, the affinities of an atom are fully satisfied when (if it be, say, biatomic,) its two centres of attraction are adapted respectively to a monatomic atom. Such a biatomic atom will be incapable of combining with any other body whatever. For example:—



the elipsoid being the symbol of a biatomic atom, and the circles representing monatomic atoms; the dots mean the centres of attraction or affinity. A non-saturated atom would be thus represented



We object to the use of the barbarous terms, monatomic atom, biatomic atom, &c. There is no occasion for both the adjective and noun, as the simple term monatomic would be sufficiently expressive.

Whilst we find so much to praise in this excellent work, we really can hardly discover anything to criticise. We notice that gelatine is stated to contain three atoms of sulphur. This assertion

we believe to be incorrect, from personal examination of that article; and it does not agree with the analysis of gelatine given in the most recent works. We were somewhat surprised to find a single addendum given, as if, into the first edition (in English) of so large a work only a solitary error could have crept. In the first page we looked at on opening the book we saw another—girconium for zirconium. On the whole, however, it will be found that few books on science have so few blemishes.

WORKS ON CHEMISTRY.

1.—*A Manual of Inorganic Chemistry.* By CHARLES W. ELIOT, Professor of Analytical Chemistry, and FRANK H. STORER, Professor of General Chemistry, in the Massachusets Institute of Technology. Second Edition London: John Van Voorst, 1, Paternoster-row, 1868. 605 pp.

2.—*Introduction to Modern Chemistry, Experimental and Theoretic.* By A. W. HOFMANN, LL.D., F.R.S. London: Walton and Maberly, Gower-street, 1865. 263 pp.

3.—*First Principles of Modern Chemistry.* By U. J. KAY-SHUTTLEWORTH. London: John Churchill and Sons, New Burlington-street, 1868. 214 pp.

4.—*A Course of Practical Chemistry, arranged for the use of Medical Students.* By W. ODLING, M.B., F.R.S., &c. Second Edition. London: Longmans, Green, and Co., 1865, 241 pp.

5.—*A Systematic Handbook of Volumetric Analysis.* By FRANCIS SUTTON, F.C.S. London: John Churchill and Sons, New Burlington-street, 1863. Pp. 282.

6.—*The First Step in Chemistry. A New Method of Teaching the Elements of the Science.* By ROBERT GALLOWAY, F.C.S. Second Edition. London: John Churchill, New Burlington-street, 1868. Pp. 472.

7.—*The Stock-Feeders Manual; the Chemistry of Food in relation to the Feeding and Breeding of Live Stock.* By CHARLES A. CAMERON, M.D., Professor of the Royal College of Surgeons in Ireland, &c. London: Cassell, Petter, Galpin, Ludgate-hill, 1868 Pp. 356.

THERE is no want of elementary books in almost every department of chemistry, and what is better than large numbers, the great

majority of modern chemical treatises are really good, practical, and accurately written works. We have before us seven elementary works of recent publication; and on the title pages of some of them there are names familiarly known to every cultivator of chemical science. The largest of these books is the joint production of two American chemists, Messrs. Eliot and Storer, and is the first English edition of a treatise which for some time past has been held in high estimation in the colleges and schools of the United States. It is confined to inorganic chemistry and laboratory manipulation. The subject of chemical physics, which occupies a large space in most chemical text books, is briefly dismissed in this volume; the authors therefore have been enabled to give descriptions of the properties of the elements and of their combinations with each other, much more detailed than in any book of the size which has come under our notice. For example, in Brande and Taylor's Chemistry—a work of 900 pages—the section on calcium and its compounds occupies twelve pages, whilst twenty pages are devoted to this subject in Eliot and Storer's chemistry. This work is well up to the present state of the science, and throughout it the new notation is exclusively employed. It is illustrated, but not profusely.

Hofmann's Introduction to Experimental and Theoretical Chemistry is an excellent little book, and might with great advantage be read by the student who is not familiar with the new views relative to the chemical combinations. The work is more theoretical than practical; but the high position of its author in the world of science has secured for it a large circulation.

Shuttleworth's *First Principles of Modern Chemistry* is, like Hofmann's work, nearly altogether devoted to nomenclature, notation, atomicity, and other theoretical subjects. It belongs to this year's products of the press, and contains the newest views relative to formulæ. In this work we notice that constant use is made of the graphic formulæ first devised by Crum-Brown, and which the author believes are not open to certain objections which have been urged against the use of Kékulé's diagrams.

Odling's *Practical Chemistry* is a little work admirably adapted for the use of the medical practitioner and student. It contains directions for the detection of inorganic and organic poisons; and the chemistry of the urine and urinary deposits is treated very fully. The book is enriched with numerous woodcuts, which, more especially in the examination of urinary deposits, will be found

very useful to the chemical microscopist. A chapter on dialysis—a process now so extensively employed in the analysis of the contents of stomachs and other complex organic substances—would have made Dr. Odling's book more perfect; but no doubt this defect will be remedied in a future edition. We notice that Dr. Odling adopts the unitary notation, but retains the old atomic weights, This is a half measure which we cannot too strongly condemn. If the dualistic system be abandoned in favour of the unitary method, we see no reason why the new views relative to atomicity should not be adopted. This book is the only one in which the new notation and the old atomic weights are conjointly used; and such a procedure is calculated to embarrass the students who are acquainted solely with the old or with new theories, and it is of no service to those to whom both the dual and unitary systems are familiar.

Sutton's *Handbook of Volumetrical Analysis* is a book which will be found useful by those chemists who desire expeditious methods of conducting quantitative analysis. This method of obtaining numerical analytical results is fast gaining ground, and will, no doubt, sooner or later lead to the abandonment of the tedious processes of filtering solutions, and the drying and weighing of precipitates.

Mr. Galloway's *First Step in Chemistry* is a book which is well adapted to the requirements of beginners in the study of chemistry; but we cannot avoid stating that the greater and the more valuable part of it is composed of direct quotations from other works. We do not believe that in any other scientific manual in the English language are there so many inverted commas to be found. Mr. Galloway not only borrows his facts from the books of other authors, but he makes a wholesale use of their language. The most elementary books are laid under contribution; and even Orr's *Circle of the Sciences* is quoted from! Indeed, this author does not describe in his own words even so simple an instrument as the hydrometer. Notwithstanding the very small merit—or rather the total want of merit—which characterizes Mr. Galloway's book as a mere literary production, it is a work which we strongly recommend; and we are glad to find that this, the fourth edition, is nearly free from the rather numerous errors which disfigured the earlier issues of the *First Step in Chemistry.*

Dr. Cameron's *Stock Feeders' Manual* is a practical treatise on the breeding and feeding of the domesticated animals. The subject of the physiology of the animals of the farm is discussed in the first

portion of the work, and more than 100 pages of it are devoted to the description of the chemical composition and nutritive value of nearly 150 different kinds of food consumed by live stock. This work contains the most recent information relative to the diseases of animals, which render their flesh unwholesome food. Every owner of a cow or horse might with advantage read this useful work.

On Malformations of the Human Heart, &c., with Original Cases and Illustrations. By THOMAS B. PEACOCK, M.D. London: John Churchill and Sons, New Burlington-street. 1866.

THE second edition of Dr. Peacock's well-known work on malformations of the heart has remained for some time unnoticed by us. It is in many respects an improvement on its predecessor, and will be found to present a very complete account of the anomalies of the heart and great vessels. The author has adhered to the arrangement adopted in the first edition, which, although not the most scientific classification, is well suited for the practical treatment of the subject. He has added an account of the most important instances of malformation which have been recorded since 1858. Among these is an interesting case which goes to support the opinion expressed by Laennec, that a patent state of the foramen ovale is not always congenital, but may be produced even in adult life. Laennec believed that the valvular laminæ might be separated, and the aperture opened as a consequence of a blow, a fall, or of violent exertion. This view, which in the first edition of his work Dr Peacock was not inclined to admit, receives corroboration from the case alluded to:—

"It occurred in a female, twenty-four years of age, who had curvature of the spine and deformed chest, but was reported to have been in usual health till a month before her death. She laboured during her illness under great dyspnœa, headache, transient delirium, irregularity of the pulse, coldness, and very marked lividity of the surface, and died comatose. The heart was large, and weighed 12½ oz. avoirdupois. There was great dilatation of the right auricle, ventricle, and pulmonary artery; and the walls of the right ventricle were much hypertrophied, measuring 4½ lines (10·2 mm. ·39 E. in.) in width. The fossa of the foramen ovale was very greatly expanded, and the valve did not

entirely cover it—an aperture existing between its upper edge and the isthmus three lines in width." [a]

The interesting subject of cyanosis has also received some further development. Dr. Peacock, with Rokitansky, Stillé, and others, regards congestion of the venous system as the cause of the discolouration of the surface of the body, which renders the appearance of a cyanotic patient so remarkable. He looks on the degree of discolouration as being more intense in cases of malformation, which allow an intermixture of the venous with the arterial blood. The conclusions at which he arrives are the following:—

"The inferences to be drawn from the facts brought forward appear to be, that, while obstruction to the flow of blood through the lungs or from or into the right ventricle, giving rise to general venous congestion, is the essential cause of cyanosis, the intensity of the lividity and its peculiar colour, are modified by other circumstances.

"The chief of these modifying circumstances are, I believe, the following:—

"1*st*. It is probably necessary to the production of intense cyanosis that, as suggested by Dr. Chevers, the obstruction to the circulation should either have been present before birth, when the capillary vessels are naturally more capacious than in the adult; or, that it should have existed before the full development of the body was attained, and while the entire vascular system was more readily dilatable; or, at least, that it should have been of long duration, so that the capillary vessels may have become greatly expanded.

"2*ndly*. The condition of the integuments also probably materially affects the production of cyanosis. In cases in which the peculiar blue or black colour is observed, the skin is usually very thin and transparent, and the body generally emaciated. Where, on the contrary, the discolouration is rather of a deep rose tint, the patients are not much emaciated or are even in some cases tolerably well nourished; and, where the skin is pallid, there is either no material congestion, or it is masked by the œdematous condition of the integuments.

"3*rdly*, and lastly. There can be no doubt that the intensity and peculiar tint of the cyanosis must be much affected by the colour of the blood in the vessels. Where a very small portion only can be submitted to the influence of the air in the lungs, the whole mass must be of an unusually deep colour, and the hue of the surface generally will be proportionately dark."

[a] Path. Trans. Vol. x., 1858-59, p. 108. This preparation is in the Victoria Park Hospital Museum. A case probably of similar character is described by M. Durozier in the Comptes Rendus de la Soc. de Biologie, 1862, p. 105.

It would be impossible to give an adequate account of a work of this kind, containing as it does a vast number of detailed cases, without an amount of quotation which would far exceed our limits. It is unquestionably the standard treatise on the subject, and one which should be in the hands of every pathologist.

Caso Pratico Luminosissimo, comprovante l'utilità del Salasso durante lo Stadio del Freddo nel Fugare ed Impedire la Recidività delle Febbri Accessionali Legittime, Restie al Solfato di China e Succedanei. Del Dottor GIAMBATTISTA MADRUZZA, Medico Comprimario Condotto Giubilato in Fano all' Eccellentissimo Dott. GUISEPPE BERETTA, Medico Distinto di Dolo. Estratto dall' Ippocratico, Serie III^{a}., Vol. XIII^{o}. Fano. Tipografia di Giovanni Lana. 1868.

A Highly Illustrative Practical Case, proving the Utility of Bleeding during the Cold Stage, in Dispelling and in Preventing Relapse of Regular Periodical Fevers, which have Resisted the Use of Sulphate of Quinia and its Substitutes. By Dr. GIAMBATTISTA MADRUZZA, &c., &c. Extracted from the Ippocratico, 3rd Series, Vol. XIII. 8vo., pp. 8.

MORE than fifteen years after the lamented death of him whom Dr. Balfour, in the number of the *Edinburgh Medical Journal* for the last month (July, 1868), justly terms "*facile princeps* of all our clinical writers," a copy of the above pamphlet reaches Dublin inscribed:—"Al Chiarissimo Graves, Celebre Clinico di Medicina, in ossequio di venerazione, e di profondissima stima." The author will learn with regret that he whom he honours has so long since ceased from his earthly labours.

The attention of Dr. Madruzza had been called in 1839 to the practice advocated by the late Dr. Mackintosh, or, as he throughout misspels the name, "Mackinstok," of Edinburgh, of bleeding in the cold stage of ague; nevertheless he hesitated to put it in practice until the month of July, 1844, when, meeting with a case which proved more than ordinarily obstinate, and in which the usual treatment with quinia, &c., had signally failed, he determined to try it, although the emaciation of the patient would seem to contra-indicate it. The several viscera were, it is stated, sound and healthy. On the 5th of July, the 52nd day of his illness, the

patient, Martelli Francesco, aged fifteen, a porter in the fish market, was bled to ten ounces, with the most marked success, in the height of the cold stage, which was most intense, notwithstanding the excessive heat of the season, and of four heavy blankets. "Vascular reaction quickly succeeded to the cold stage; the diaphoresis was profuse upon the decline of the fever, and was protracted beyond decided apyrexia, which was not again disturbed; and from day to day the organic repair, assisted by special and graduated diet, removed the marasmus; and about the middle of August Martelli was dismissed from hospital, in perfect health, which still continues; nor was he again attacked with intermittent fever."

The author considers his case to be a true triumph for Mackintosh's doctrine, and that it ought to encourage practitioners to adopt a treatment sanctioned by the most celebrated clinical teachers, and among these by Professor Graves, from whose *Clinical Medicine* he quotes the following words:—

"Subsequently the practice of bleeding in the cold stage [of ague], as introduced by Dr. Mackintosh, was tried on an extensive scale in the Meath Hospital, and it is a practice which I can strongly recommend in those cases where there is recurring inflammation of some internal organ." [a]

The experiments here referred to were made by Dr. Stokes, and are detailed by him in the *Edinburgh Medical and Surgical Journal*, Vol. xxxi., January 1, 1829, page 1. The effects of venesection during the rigor there described are:—"Checking the rigor altogether; momentary suspension of the rigor; checking the rigor after a certain quantity of blood was drawn; its return in a mild degree; diminution of its intensity, but not of its length; relief of the local symptoms alone; prolongation of the rigor without diminution of intensity; no apparent effect; disappearance of the rigor on the fourth pyrexial day after the operation, but persistence of the symptoms indicative of internal congestion."

Dr. Stokes gives abstracts of twenty-two cases in which bleeding in the cold stage of ague was resorted to, and of which accurate records were kept. We agree with him that an examination of these cases is calculated to leave an impression against the indiscriminate or even frequent use of the operation at such a time.

[a] Neligan's Edition. Dublin: Fannin & Co. 1864. P. 274.

Many of the patients had an extremely slow and dangerous convalescence; in several instances the disease appeared to be exasperated by the practice; local inflammatory affections occurred several times after the operation; and, lastly, the bleeding appears to have a tendency to convert intermittent into continued fever. Dr. Stokes concludes that "these facts should make us very careful how we interfere with nature by means of the lancet, in simple intermittent, when we have so certain, and, as far as I have seen, so infallible a remedy as the sulphate of quinine." Probably, therefore, the practice, if adopted at all, should be restricted to those cases specified by Dr. Graves, "where there is recurring inflammation of some internal organ." Possibly it may be more useful in the malignant forms of ague common in hot climates than in the milder varieties of the disease witnessed in these countries.

1.—*Epidemic Meningitis, or Cerebro-Spinal Meningitis.* By Alfred Stillé, M.D., Physician to the Philadelphia Hospital, &c. 8vo., pp. 178. Lindsay and Blakiston. 1867.

2.—*Publications of the Massachusets Medical Society*, Vol. ii. No. I.—*Spotted Fever, or Cerebro-Spinal Meningitis.* 8vo, pp. 178. Boston: Clapp and Son. 1866.

3.—*Klinische Beobachtungen über Meningitis Cerebro-Spinalis Epidemica.* Von Prof. Ziemssen and Friedrich Hess, in Erlangen. Deutsche Archiv für Klinische Medicin. 1866. Bd. 1; pp. 72, 346.

4.—*Clinical Observations on Epidemic Cerebro-Spinal Meningitis.* By Professors Ziemssen and Hess. Archives of Clinical Medicine, 1866. Vol. i.; pp. 72, 346.

The brief but lucid essay of Dr. Stillé has earned for the work, the title of which heads our notice, a place which, we venture to predict, will be an enduring and an ever-honourable one in the literature of epidemic meningitis.

History of Epidemic Cerebro-Spinal Meningitis.—A very succinct sketch of the history of the disease occupies the first four pages. The outbreaks have been marked by simultaneity in Europe and America, and by their covering periods of years. The first is

that which is recorded by many observers as spreading over the eleven years from 1805 to 1816, the second extended from 1837 to 1850, while the third dates from 1856, and embraces the current year.

So early as 1802 Bascombe, in his "History of Epidemic Pestilences," speaks of an epidemic at Rettingen, in Franconia, attacking the young and strong, marked by lacerating pains in the nape of the neck, fainting, anguish of the heart, rigidity of the limbs, and death often within twenty-four hours. It is not improbable that even at still remoter epochs epidemic meningitis prevailed, but that its diagnosis from other diseases, characterized by nervous symptoms and cutaneous eruptions, had not been sufficiently established, while the difficulties that stood in the way of *post mortem* examination made the recognition of the pathological conditions of cerebro-spinal meningitis all but impossible.

Between 1805 and 1815 the disease prevailed in one form or another, and with more or less fatality in Prussia, Holland, the Rhine borders of Germany, Bavaria, the east of France, but not elsewhere in Europe. In the United States it began its ravages in 1806, at Medfield, Massachusets, and subsequently appeared in New England, Canada, the State of New York, Pennsylvania, and other States to the south and west (not specified by Stillé). In 1822 it made its appearance at Vesoul, in France; in 1828, at Middletown, Connecticut; in 1828, in Trumbull County, Ohio; in 1830, at Sunderland, in England; and in 1833, at Naples. No record of its occurrence marks the four following years, but in 1837 the disease assumed a new and widely-ranging activity. For two years it was almost exclusively confined to France; in the third and fourth years it spread to parts of Italy, to Gibraltar, and to Algeria; and a year or two later it visited parts of the north of England, and Dublin, reaching Denmark in 1845 to 1848. "While the epidemic was thus spreading through Europe," says Stillé, "it again appeared in the United States at places as remote as possible from transatlantic communication, and hundreds of miles distant from one another."

From 1850 to 1854 epidemic meningitis is not recorded in Europe or America, when, in the latter year, it broke out with extraordinary violence in Sweden, which had escaped the disease at all former periods, and it remained endemic in that country for the six subsequent years. During the same period local outbreaks of limited extent took place in London, Dublin, and Stafford; in

North Carolina, where it appeared for the first time in March, 1856; and in the central portions of New York and Massachusets early in 1857.

The epidemic, of which we are still witnessing occasional examples, appears to have commenced with the outbreak in Holland in 1860-61; in the following year it spread over a large part of Portugal; in the summer of 1863 Germany, almost exempt since the outbreak of 1806, became the seat of a visitation which, commencing somewhat mildly, eventually devastated almost every part of northern Germany; and in the year 1865 the disease made its appearance in Dublin. As a counterpart to the European epidemic of the period under consideration numerous localities in the United States were visited by the disease. It appeared at Livingston County, Missouri, in the winter of 1861-2, and at Indiana, Kentucky, and Connecticut. From 1860 to 1864 it prevailed at Ohio, and in the last year at Illinois. In 1863 it showed itself at Newport, Rhode Island, and in Vermont in 1864. In 1863 it commenced in Philadelphia, and since then has prevailed in that city, and in Maryland, Virginia, North Carolina, Alabama, and other Southern States.

Question of Contagion.—Stillé remarks, with great truth, on the absence of any common conditions in these varied and widespread visitations, noting their frequent outbursts in mid-winter, and insists on the true *pandemic* nature of the disease.

It is well observed in the Massachusets Report, that "The evidence from all sources has been very generally in favour of the *non-contagiousness* of the disease." All attempts to account for its wide-spreading activity, on the theory of contagion, will be found, in our opinion, to be utterly untenable. The instances in which the disease, in its most terrible form, has occurred in isolated cases, without propagation to those in contact with the sick, are out of all proportion to those in which any two cases occurred under the same roof, with any, even probable, ground of belief that one was the immediate cause of the other.

Etiology and Origin of the Disease.—Of this it may be as briefly as positively affirmed, that absolutely nothing is known, or even determined, as probable. Epidemic meningitis occurs in all seasons, in all climates, in all races, including the *black* race in the United States, in both sexes, at all ages, in towns and country districts, under all conceivable circumstances of good and bad ventilation, sewage, food supply, and state and habit of life.

Nature and Pathology of the Disease.—In attempting to give a general idea of epidemic meningitis, Stillé well observes on the protean characters its various forms present, which in a large measure account for the conflicting views expressed with regard to its pathology by different writers. One writer dwells on its "nervous, inflammatory, and comatose" phenomena; another describes them as "neuralgia, delirium, convulsions, paralytic, and comatose;" a third speaks of "abortive, malignant, intermittent, and typhoid" forms. Our author regards the entire series of phenomena thus variously designated as traceable to "lesions essentially the same in all; although varying in degree as much as congestion does from exudation, and in extent from what is invisible to the naked eye to a profuse accumulation of inflammatory products." Of this absolute unity of the diseased states, now generally recognized under the head of cerebro-spinal meningitis, we are ourselves by no means satisfied. Indeed, Stillé, in no doubtful words, marks his own sense of the frequently dual character of the chief phenomena, when he says, page 10:—

> "Such opportunities were peculiarly fitted . . . . to illustrate the surprising variety of morbid phenomena, which the former (epidemic meningitis) exhibits by virtue of its double character as a blood-disease, and an inflammation of the cerebro-spinal membrane."

In a very able section devoted to the consideration of the symptoms of the disease, Stillé passes in review all the chief clinical phenomena presented in the most varied cases.

Taking the whole of the cases well recorded in Europe and America, he concludes that the number of those in which petechiæ were found formed but a small proportion, probably not one-tenth of the whole; but the Massachusets Report gives a higher proportion, it being stated, at p. 99, that of 249 cases competent to be reckoned upon, 129, or somewhat less than 59 per cent., exhibited petechiæ, or "analogous spots." This last vague definition, in our mind, not a little invalidates the observation.

As to the pathological interpretation of those cases which presented well-marked nervous symptoms during life, with absence of spots, and which recovered, no serious difference of opinion probably ever existed. And of the nature of those cases with nervous phenomena during life, and in which *post mortem* examination revealed the presence of lymph or pus on the membranes of the cord and brain, or even well-evidenced congestion, no doubt can

be entertained. But there remains two sets of cases the complete pathological interpretation of which, we hold, has not yet been conclusively defined. We allude to:—

A.—Cases in which symptoms referrible to the nervous system have been present during life, with more or less well-marked petechial eruption, or purpuric discoloration of the skin over more or less extended portions of the surface, and in which, on *post mortem* examination, lymph or pus, or other evidence of inflammatory action in the membranes of the brain or cord, has been detected.

B.—Cases in which petechiæ, or purpuric discoloration, have been present during life, but in which there have been found to be no traces of inflammatory action in the spinal membranes on most careful *post mortem* examination.

In some of these latter cases the brain and cord, and their membranes, have been found absolutely and undeniably healthy.

In another class of cases the membranes of the brain and cord, with other internal surfaces, have shown purpuric discoloration, or absolute hemorrhagic effusion to a more or less considerable extent, phenomena, which it is needless to say, are in no way attributable to inflammatory lesion, and which are common to such diseases as purpura hemorrhagica and yellow fever, and to states of the body the result of certain forms of vegetable or animal poisoning, death by lightning, and some other not well-defined conditions, in which there is no question of inflammatory action.

Of these varieties of disease well-marked examples have been published by various writers.

A very remarkable and important series of five specimens of the spinal cord were presented in the last session of the Pathological Society of Dublin by Dr. Lyons. In two instances nervous phenomena in non-petechial cases during life were found to be associated, *post mortem*, with well-marked arachnitis of the brain and cord proceeding to lymphy exudation. In three instances petechiæ and purpuric patches were present during life in cases in which there was found, *post mortem*, no evidence whatever of the slightest inflammatory lesion in brain or cord. Drs. Benson and Hewitt, and other observers, also of this city, have given proof of the non-existence of any sign whatever of inflammatory lesion in cases which, during life, exhibited petechiæ and purpura.

Dr. Mapother has published particulars of a well-marked case of purpuric spotting during life, with copious hemorrhagic effusion on the membranes of the brain, found *post mortem*.

The Massachusets Report furnishes another, and, in our mind, very conclusive case at page 45.

What position in the nosological scale those cases are destined finally to occupy may be yet doubtful; but we affirm that they are *not* of affinity with cerebro-spinal meningitis.

The observations of Ziemssen and Hess will be found well worth attention, but our limits prevent us from examining them at present. They are illustrated by numerous pulse-tracings.

Association for Promoting the Extension of the Contagious Diseases Act, 1866, *to the Civil Population of the United Kingdom.*

The above Association, which has been in active operation for some time, has issued a Report on "the extent of Venereal Disease, the operation of the Contagious Diseases Act, and the means of checking Contagion." And, before entering on the consideration of the important and valuable information presented in its pages, it may be well to refer briefly to the "objects" of the Association, and the great social benefits to be anticipated from its labours.

The "objects" of the Association appear to be two-fold—firstly, the isolation of those labouring under syphilitic diseases, whereby the propagation of the contagion may be prevented; and, secondly, yet first in importance, the moral and social improvement of the unfortunate women, whose condition so urgently calls for our most earnest sympathy and consideration. The Association is entirely opposed to the Continental system, by which prostitution would seem to be licensed; on the contrary, its chief end and aim is to discourage that fearful vice, by which so many unhappy females are brought to degradation and an untimely grave.

Such are the objects of the Association, clearly and unequivocally laid down, not only in their report, but also in all previous documents issued under their authority. And yet difficulties are raised and suggestions started as to its operations having an immoral tendency, and being calculated to engender a further incentive to vice. We are told, in fact, that the present movement will eventuate in the encouragement of prostitution! It has been boldly asserted that syphilis has been instituted, as it were, as a punishment for vice, and as a deterrent for the libertine, and that, as we value virtue, we cannot discard its aid! All this, and more,

has been put forward in opposition to the Association, but we venture to hope that results, which after all must stand as the best tests, will eventually disprove such views; and we moreover feel confident that if it should in time appear that, under the preventive system, not only prostitution and disease have diminished, but that the moral condition of the unfortunate females has been raised, the very originators of these mistaken views will be the first to congratulate the Association on the incalculable benefits they have achieved for humanity. Already have these gratifying results begun to appear under the operation of the Act now in force at some of our naval and military stations; and, previous to entering on any detail, we shall endeavour to explain very briefly the nature of the Act as it now exists, and the important sanitary and social improvements that have been secured by its provisions.

In the year 1866 the Act was passed by the Legislature, having for its object the prevention of contagious (venereal) diseases at certain of our naval and military stations in the United Kingdom. The absolute and pressing necessity for this measure became at once apparent on reviewing the deplorable consequences that resulted to two most important branches of the public service, from the dissemination and spread of the venereal poison. The civil practitioner can have no adequate conception of either the extent or effects of this great and destructive evil. It preyed upon the efficiency of our army, and its baneful influence equally interfered with the sanitary condition of our navy. The large number of men rendered temporarily unfit for duty in both services, and the numerous cases invalided from year to year from the effects of the contagion, presented an accumulated record of such magnitude as will enable us to estimate the vast expense that must have been entailed on the country by the disease spreading without check or control in our naval and military stations. Our readers will doubtless be surprised on learning that, according to the evidence of Admiral Sir W. Fanshawe Martin, K.C.B., no less than half of the invaliding in the navy was due to venereal; the multiplied facts deducible from the effects of the contagion in our army, strengthened the conviction as to the necessity for some preventive measures to control and counteract the spread of an evil so destructive to the efficiency of both branches of the service. And we have no doubt that now, as the Act is available, every possible advantage

will be taken of it by the able and efficient administrators at the Admiralty and War Office.

Under the Act 1866, it is provided that any woman in any place to which its provisions apply, found to be affected with contagious (venereal) disease, shall be liable to be detained in a certified hospital, until discharged therefrom on a certificate under the hand of the principal medical officer: and in the framing of the Act it will be seen that every caution has been displayed to avoid any possible abuse of its powers. No woman can be required to submit to medical examination until "information on oath is laid before a justice of the peace by a superintendent of police," to the effect that the informant "has good cause to believe that the woman is a common prostitute, and either is resident within the limits of any place to which the Act applies, or being resident within five miles of those limits, has, within fourteen days before the laying of the information, been within those limits for the purpose of prostitution." In such case "the justice may, if he thinks fit, issue a notice thereof addressed to such woman, which notice the superintendent of police shall cause to be served on her;" and "if the woman on whom such notice is served appears herself, or by some person on her behalf, at the time and place appointed in the notice, or at some other time and place appointed by adjournment," the justice present, "on oath being made before him, substantiating the matter of the information to his satisfaction, may, if he thinks fit," order the woman to be subjected to a periodical medical examination by the visiting surgeon, for any period not exceeding one year, for the purpose of ascertaining if she be affected with a contagious disease. The times and places for these examinations are regulated by the Admiralty or Secretary of State for War, and they are specified in the orders issued by the justices, copies of which orders are served on the woman by the superintendent of police. If the woman does not appear, and it is "shown (on oath) to the justice present that the notice was served on her a reasonable time before the time appointed for her appearance, or that reasonable notice of such adjournment was given to her"—in such case the justice proceeds on the matter of the information, being substantiated on oath, and, if he thinks fit, issues the order.

Under the Act, powers are given to the Admiralty or Secretary of State for War to provide certified hospitals in which the women found to be affected with a contagious disease are liable to be

detained on a certificate to that effect signed by the visiting surgeon. The certificate is to be in duplicate—one to be delivered to the woman, and the others to the superintendent of police. If the woman, after the certificate is delivered to her, refuses to go to the certified hospital named in the certificate, "the superintendent of police, or a constable acting under his orders, shall apprehend her," and convey her to the hospital for treatment on the authority of the above certificate of the medical officer. The detention in hospital is regulated by the visiting surgeon, on whose written certificate she is discharged.

The reception of a woman in a certified hospital involves an undertaking to provide for her care and treatment, lodging, clothing, and food during her detention in hospital, and while being conveyed or transferred to a certified hospital, she is deemed legally in the custody of the person conveying, transferring, or detaining her. But in order to make further provision against any abuse of the Act, clauses are introduced to limit the detention to three months in hospital under the same or any one certificate, and enabling the woman to apply to the justice for discharge if she considers herself entitled to it. This she obtains if the justice is satisfied on reasonable evidence that she is free from disease. Special clauses are introduced, setting forth various penalties instituted to secure the due fulfilment of the provisions of the Act. Nothing unreasonable or partaking of unnecessary severity will be found here; nothing that is not absolutely called for to carry out objects of such great importance to the public welfare.

With regard to the medical examination, it is satisfactory to know that this part of the Act, so far from meeting with any opposition from the women, has, according to the interesting report of Mr. Berkeley Hill, been accepted by them at Chatham and other stations, and conformed to as long as the examinations are conducted regularly, and not by singling out particular females, whereby they become objects of reproach to their companions. Indeed many of them voluntarily submit themselves for medical examination; for this, it may be observed, a special provision is introduced into the Act. This information affords a valuable hint to the medical officers, as to the necessity for conducting this part of their duty with the most scrupulous regard for the feelings of those poor misguided creatures, whom it ought to be our object, not only to relieve from their bodily ailments, but also to impress on, and

teach while under our treatment, that there is a public interest in operation for their good, and the permanent improvement of their moral and social condition. This will tend to convince them that they are no longer miserable outcasts, but that they constitute a class which has gained the sympathy of a large and influential section of the community.

The Act, as it is at present framed, applies to Portsmouth, Plymouth, Devonport, Woolwich, Chatham, Sheerness, Aldershot, Windsor, Colchester, Shorncliffe, the Curragh, Cork, and Queenstown. And the beneficial results that have accrued from its operations have been most encouraging. At Chatham, we learn, on the authority of Mr. Berkeley Hill, that "the hospital was considered a very good thing by all the women, one of whom declared she would always come back to Chatham if she ever became ill elsewhere." This is of importance as evidence of the efficiency of that institution, which we learn from the report has forty beds, and, in case these should be all occupied, additional accommodation is provided in London, where there are eighty beds for patients from Chatham, Woolwich, and Sheerness.

The information afforded by Dr. Anderson, Deputy Inspector-General of Melville Hospital, is most valuable as to the beneficial effects derived from the Act, both in alleviating the severity of the disease, and in diminishing the number of men attacked by it amongst the marines at Chatham. His statistics appear in the 35th page of the report, prepared by Mr. Berkeley Hill, and afford very satisfactory results. In the same page Mr. Hill gives us some highly gratifying information as to the operation of the Act in improving the social and moral condition of the women. At Chatham, Rochester, and Stroud, "the moral condition and feeling of the women," he tells us, "are greatly raised." The police, we learn from the same source, have become their protectors by rescuing them from the tyranny and brutality of the low beer shop keepers. But, whilst we dwell on these gratifying and encouraging facts, we must not conceal from ourselves that we are but in the beginning of our labours. The facts put forward so admirably by Mr. Hill, not only teach us what has been done, but emphatically point out to us what may yet be effected by judicious and persevering efforts. The mere perusal of the interesting report before us, which we have but lightly touched on, must satisfy us that there is a state of misery and appalling degradation wide-

spread and deep amongst our female population arising from prostitution and disease, which no private enterprise nor philanthropy can remedy. To the Legislature then we turn for the means of counteracting this great social evil which is undermining both the mental and physical condition of the people.

It is a remarkable fact that, notwithstanding the agitation which has of late taken place regarding the destructive influence of the venereal disease, and the deplorable consequences resulting therefrom to our civil population, an impression is abroad that the poison has been deprived of much of its original virulence, and that it is by no means so widespread nor frequent as it was in former periods. No error can be greater nor more deceptive than this; and it is of the first importance that it should be corrected, because it is peculiarly calculated to deceive the public mind, and thereby render it indifferent to the urgent necessity that exists for the preventive measures now so urgently required for the health and well-being of the community. In estimating, or rather describing, the subtle and poisonous influence of the contagion, we cannot do better than quote the following remarkable and impressive passages from the well-known work of Parent-Duchatelet, "De la Prostitution dans la Ville de Paris":—

"De toutes les maladies qui peuvent affecter l'espèce humaine par voie de contagion, et qui portent à la société les plus grands préjudices, il n'en est pas de plus grave, de plus dangereuse et de plus à redouter que la syphilis. Sous ce rapport, je ne crains pas d'être démenti, en disant que les désastres qu'elle procure l'emportent sur les ravages qu'ont exercés toutes les pestes qui, de temps en temps, sont venues porter la terreur dans la société.

La syphilis est chez nous, elle est chez nos voisins, elle est dans l'univers; elle ne tue pas immédiatement, il est vrai, comme beaucoup d'autres maladies, mais cela n'empêche pas que le nombre de ses victimes ne soit immense. Ses ravages n'ont pas d'interruption; elle frappe de préférence cette partie de la population qui, par son âge, fait la force aussi bien que la richesse des états. La syphilis vient énerver cette population au moment même de son existence, où, par les lois de la nature, elle se trouve en état de procréer des êtres vigoureux; et si elle ne rend pas cette population stérile, les malheureux qui en proviennent forment une race abâtardie, aussi impropre aux fonctions civiles qu'au service militaire, et qui, en

définitive est un fardeau pour la société. Enfin, l'innocence et la vertu la plus pure ne sont pas, dans nos sociétés modernes, à l'abri de ses atteintes: que de nourrices mercenaires, que d'épouses vertueses, que d'enfans à la mamelle n'en sont pas tous les ans, cruellement attaqués!"

It has pleased an all-wise Providence, in his solemn and mysterious dispensation, to afflict the human race with divers diseases and bodily ailments; some of these are accompanied by unspeakable sufferings, and either with rapid strides or by slow degrees, but not less certain results, terminate in that death which may be looked on as a merciful release from bodily anguish. But of all the varied and complicated forms of disease that have come under our notice, we believe that not one—even one—of the fearful catalogue could present such awful features or consequences as the graphic description Parent-Duchatelet has presented to us of syphilis in the above passages. Every sentence therein is full of truth, and bears on it a lesson which no statesman nor philanthropist can be indifferent to. And doubtless it is such knowledge that has now awakened public attention and created the present movement in favour of some enactment which may save the present generation, and their children's children, from the terrible consequences described in the lines we have just quoted.

But, fearful as is the picture drawn by Parent-Duchatelet, he has not given all. He has omitted to notice that wretched and pitiable condition into which the miserable victim to the disease, in some instances, passes, after the subtle and insidious effects of the poison have involved all the tissues of the system, reducing the whole to an incurable wreck, the intellect becomes enfeebled and the mind weak, and all those nobler and higher qualities which stamped our nature in its primitive integrity seem to be impaired. Unquestionably we have seen a few, happily but a few such results. A very melancholy instance is at present under our notice. It is the case of a gentleman whom we knew in very early life. As an example of a man we have seen but few that surpassed him in noble form or physical condition; quick in intellect and possessed of remarkable conversational powers. He had been afflicted with the phagedenic form of the disease, which we believe to be incurable if neglected in the earlier stages.[a] Such was this gentleman's case

[a] Observations on Venereal Diseases. By Hamilton Labatt, p. 165.

when we saw him in consultation with the late Mr. Carmichael. We shall not attempt to detail his many long and tedious years of suffering; but he is now a wretched remnant of himself—stooped, distorted and disfigured, hideous to look on, and all his conversation and remarks characteristic of approaching imbecility. It is but an act of justice to the distinguished surgeon who saw this case with us, as well as to ourselves, to record in these pages that nothing could exceed the reckless indifference this unfortunate gentleman displayed in the earlier stages, both to the proper care of himself, as well as to the observance of the directions he received from his surgical attendants.

We may mention that, previous to the year 1866 (the year of the existing Act), certain preventive measures, in respect to the registration and inspection of prostitutes, authorized by the previous Contagious Diseases Prevention Act, 1864, were put into operation abroad, with the best results; and we have in the admirable report before us a very interesting letter, dated from Malta, addressed by Lieutenant-General Sir Henry Storks, K.C.B., to Mr. Skey, as Chairman of the Committee in London, in which it is stated that, under the above system, "the disease may be said to have almost disappeared in the Islands of Corfu, Zante, and Cephalonia." And, again, in the same communication, General Storks observes, "In Malta the same police regulations exist, and I know of no place so singularly free from venereal disease as regards the professional prostitutes." The letter closes with the following impressive passage:—"The amount of disease and misery that would be prevented by enforcing a sanitary inspection of prostitutes is incalculable, and it is a subject which earnestly claims the attention of the authorities competent to deal with it."

It would be needless to pursue farther the very convincing evidence which can be produced in favour of the great advantages that would result from an extension of the Act of 1866. We know that difficulties must be encountered at first in introducing it amongst our civil population; but we are confident that, under an administration duly tempered with a careful consideration for the feelings and prejudices of the people—all these would speedily subside. Only teach them that you are working for their individual good and they will be seen to unite and co-operate with you.

That the Association, as now organized, is fully equal to the importance of its mission, there can be little doubt. A few months

have scarcely elapsed since the first meeting was held in London. At that early period we augured most favourably as to the ultimate prospect of success, seeing the influential, though small number of individuals who had attached themselves to the movement. We then had Fergusson, Jenner, Anderson, Watson, Paget, Burrowes, and other eminent men of our own profession, as Vice-Presidents, and with them were associated other distinguished men who, though not connected with the medical profession, heartily co-operated in the labours of the Association. Subsequently, and through the untiring energy and perseverance of the able honorary secretaries for London, Mr. Berkeley Hill and Mr. Curgenvan, the numbers greatly increased, and the long list attached to the report, just published, presents a display of intellect and influence which cannot fail to have weight with the Legislature. But the Association is not confined to London. In Edinburgh and Dublin vice-presidents, committees, and honorary secretaries have been appointed, and the same has been effected in upwards forty other leading cities and towns throughout the United Kingdom. It would be invidious as well as unnecessary to select from the long list in the report any particular names—all, in our estimation, deserve equal prominence from their devotion to this noble cause. Indeed we should not have put forward the names we have already mentioned, but that we feel and believe there is a peculiar distinction due to those who have laboured in this great cause from the beginning, and who, by their high position and eminence, have attracted the support and co-operation of the many distinguished men who subsequently joined the Association.

It is a matter of congratulation that, during the present Session of Parliament, this important movement has engaged the serious attention of the Legislature. Questions connected with it have been put in the House of Commons to the Government; and very recently Lord Lifford (one of the vice-presidents, whose zeal in this good cause is beyond all praise,) has obtained a select committee of the House of Lords to inquire into the subject. That committee, which includes amongst its members some of our most influential Peers, has been sitting on the question, and we learn will soon issue their report. Much will depend on the substance of that document, but from the knowledge we have of the energy, perseverance, and business-like habits of the noble chairman (Lord Lifford) we entertain confidence as to the result, provided he

receive that support which he has a right to expect, and which it is our obvious interest to extend to him.

Contemporaneous with this legislative inquiry a very influential meeting has been recently held in London under the chairmanship of Sir Thomas Watson, Bart. The long list of noblemen and gentlemen, including Members of the Houses of Lords and Commons, who attended that meeting, fully attests the very great interest felt on the subject.

Although we have considered it inexpedient as well as unnecessary to enter into the particulars of the organization of the Association in the various localities, it would be a great omission to pass without some notice what has been done in this couutry in furtherance of the movement. In Dublin Mr. Porter, President of the College of Surgeons, with Professors Hargrave, Banks, Mapother, and Colonel Adamson, have been appointed Vice-Presidents of the Association, and a very able and efficient committee, composed of the following gentlemen, all well known and distinguished for their professional acquirements, has been formed: — Professor Geoghegan, Drs. Wilmot, Byrne, Head, Irvine, Lentaigne, and Robert MacDonnell, with our respected Magistrate and Town Councillor, Mr. Henry Maclean, who has ever evinced a sincere interest in everything calculated to advance the public good. At a very early period of the movement Mr. Hamilton Labatt, author of the work on Venereal, and several other publications on Syphilitic Venereal Diseases, was requested and consented to act as Honorary Secretary for Dublin. Under this organization a meeting was held at the private residence of the Honorary Secretary in Upper Fitzwilliam-street during the past winter, and some important resolutions passed, which were transmitted to London. In Cork and Belfast the movement has been adopted and officers appointed; Dr. Armstrong has been nominated honorary secretary in the former town, and Dr. Mac Cormac in the latter. And we have much satisfaction in stating that the office of vice-president in Belfast has been accepted by the Lord Bishop of Down and Connor.

We shall now close our remarks on this all-important subject, but not without a fervent and sincere hope that success may ultimately crown the efforts of the Association. We know of nothing more noble, nothing more exalted than the objects they have in view; and so, in proportion will, of a certainty, be to them the deep and lasting gratitude of mankind.

PART III.

MEDICAL MISCELLANY.

Reports, Retrospects, and Scientific Intelligence.

A REPORT

UPON

EPIDEMIC CEREBRO-SPINAL MENINGITIS, OR CEREBRO-SPINAL FEVER.

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Shortly before the middle of the present century the medical profession in this country became aware of the existence of a disease of an epidemic nature, which, as far as we can learn, was previously unknown, save to those among them who had access to the medical literature of the contitents of Europe and America—a matter of greater difficulty then than now. This disease, to which the name of "cerebro-spinal arachnitis" was at that time given by one[a] who, though now no more, has left us so faithful a record of it, has since, at times, in milder form, appeared among us. Twenty years, however, passed away before it again assumed its former epidemic character. At the end of this period, in the spring and later months of 1866, an appalling type of the disease manifested itself in Dublin and several of the provinces. During the subsequent epidemic of cholera it remained in abeyance; but, on the subsidence of the former early in 1867, soon showed itself with renewed vigour, nor have cases since been wanting to remind us of its presence even still. This epidemic, immediately preceded as it was by a remarkable outbreak of the same malady in Germany and several of the United States of North America, has acquired for the disease a position in the medical literature of these countries, which, till then, it had been denied.

[a] Mayne, R. Dublin Quart. Jour., Aug., 1846, p. 95.

In proof of this fact, we need only point to the vast addition which, within the last few years, has been, and is being, made to our knowledge of the disease. Germany, America, England, and lastly Ireland, have each been foremost as the occasion and the time demanded; and the latest systematic works on the Principles and Practice of Medicine[a] in the New World and the Old, have now devoted to the disease that space and consideration previously wanting, which its formidable nature, its singular phenomena, its numerous and recent epidemics in places widely separated, and increased experience with the recent accessions to our knowledge thereby acquired, rendered necessary.

At such a time as this it may be interesting to consider the progress of the disease in those countries where, previous to the more recent experience in our own isle, it had been long known and studied.

The history of many, if not all, diseases in ancient times, to a great extent, is shrouded in obscurity, from the imperfection and inaccuracy of medical knowledge and medical writings; nor is the history of even such remarkable diseases as epidemics handed down with such accuracy that at the present day we can clearly distinguish their nature. Hence it is that we feel ourselves quite unable to trace the history of this peculiar disease further back than the commencement of the present century. An attempt, indeed, was made by Gallup,[b] in 1815, to connect it with the epidemics of the petechial and spotted fevers, which prevailed at various dates before 1800 throughout the continent of Europe. We do not know, however, to what diseases these names apply. We do not know whether, what one writer may have called petechial, another may not have called spotted fever, nor whether one or both names were applied to typhus fever, or to the disease under consideration. The fact is, that we have no certain evidence on which to rely regarding the occurrence of the disease previous to the commencement of the present century, though it is naturally to be presumed that such occurrences took place. Stillé,[c] the latest American writer upon the subject, alludes to a local epidemic which occurred at the small town of Rœttingen, in Franconia, in 1802, in a manner which seems to imply the existence in his mind of some connexion between this epidemic and cerebro-spinal meningitis. He is opposed in this view, however, by an authority no less eminent than the Historian of the "Epidemics of the Middle Ages," who regards the Rœttingen epidemic as one of the so-called "sweating sickness." Moreover, the accounts left us are so meagre that we would be slow in pronouncing definitely upon it. On

[a] Geo. B. Wood. Philadelphia: 6th ed., 1867. Vol. i., art. "Petechial Fever." J. R. Reynolds. London: 1868. Vol. 2; art., "Epidemic Cerebro-Spinal Meningitis."

[b] Gallup, J. A., Sketches of Epidemic Diseases in the State of Vermont.

[c] Stillé, A., Epidemic Meningitis. Philadelphia: 1867.

the other hand, we cannot agree with Radcliffe,[a] in referring our first actual knowledge of the disease to so late a period as 1837, when it manifested itself so markedly in the South of France. Were we to do so, we should overlook the plain evidence to the contrary of many European and American physicians.

It is in 1805 that, for the first time, we have undoubted evidence of the occurrence of an epidemic of cerebro-spinal meningitis. In that year, from February till April, it prevailed in the city of Geneva and its environs, and was closely observed by Vieusseux and Mathey,[b] who, in the same year, published an account of their experience, declaring that neither they nor their colleagues had ever seen a similar disease. A petechial eruption was a prominent sign, and it is described as a malignant non-contagious fever. An autopsy, in one case, revealed an exudation both upon the upper and under surfaces of the brain, the cerebellum, and medulla oblongata. Of those attacked, the number of which is not mentioned, thirty-three succumbed. This account, in which we find an unmistakable picture of epidemic cerebro-spinal meningitis, possesses a peculiar interest not alone as the first, but as the only available record regarding the prevalence of the malady in Switzerland.

In each of the eleven following years isolated outbreaks of the disease occurred in various portions of Europe,[c]—thus, in the Prussian army, in 1806-7; in Briançon and Ashburton (England), 1807; Dantzic, 1811; Brest, 1813; Grenoble and the garrison of Paris, 1814; Metz, Pont-á-mousson, Sarreguemines, Mainz, Grenoble, and Paris, 1813-16.

During this period it also ravaged the United States of North America, commencing, as far as we can learn, in 1806, at Medfield, in Massachusets; and in the ten succeeding years it extended throughout New England, visiting, besides many States in the South and West, the State of Pennsylvania, New York, and even Canada. There can be no doubt that this epidemic, which prevailed in North America from 1806-16, and which has been so accurately described by Danielson and Mann, Strong,[d] North,[e] Hale,[f] and others, under the name of "spotted fever," was truly a cerebro-spinal meningitis. Nor would any such comment here be necessary were it not that so distinguished a physician as Hirsch[g] states that "this disease" (*i.e.*, spotted fever) "had nothing in common with that under consideration." No more conclusive

[a] Radcliffe, J. Netten., in Reynold's System of Medicine. Vol. ii., p. 676.

[b] Cf. Journ. Génér. de Méd. xi., p. 163, 243.

[c] Boudin, C. M., Traité de Géographie et de Statistiques Médicales. 1857.

[d] Med. and Philosoph. Register. Philadelphia: 1811. I. 12.

[e] A Treatise on a Malignant Epidemic, commonly called Spotted Fever. New York: 1811.

[f] History and Description of an Epidemic Fever, commonly called Spotted Fever. Boston: 1818.

[g] Die Meningitis Cerebro-Spinalis Epidemica. Berlin: 1866, p. 11.

answer can be given to such a statement than a mention of the fact that, beside the record of the autopsies, the writers on this epidemic, as they gained increased experience, almost universally protested against the designation they had previously adopted, owing to the inconstancy of the eruption which they had at first considered so characteristic of the disease.

The only knowledge[a] we now possess of the further progress of the disease before 1837 is that, in 1822, a temporary outbreak took place at Vesoul, in France; in 1823, at Middletown, Connecticut; in 1828, in Trumbull County, Ohio; in 1830, at Sunderland, England; and in 1833, at Naples. In 1837, however, we again meet with it as a wide-spread epidemic, devastating, during a course of thirteen years, France, Italy, Germany, Ireland, England, Denmark, Gibraltar, and some parts of Spain, in Europe; the province of Algeria, in North Africa; and, finally, a great number of the United States, in North America.

The first general epidemic[b] of the disease, which visited France in 1837, as Hirsch has pointed out, appeared almost simultaneously in two portions of the Southern district, and spread thence over a large portion of the country in a northerly direction. One of these was Bayonne, in the south-west, where isolated cases were observed among the garrison during this and the two succeeding years. At the same time, the disease appeared in some of the provinces—in the districts of Dax, Mugron, Tartas, Bourdeaux, La Rochelle, &c., towns and villages situated upon the banks of the Adour—the civilians alone suffering. In the spring of 1838 it visited Rochefort, and was at first exclusively confined to a regiment which had come from one of the provinces. At the end of the year, however, it broke out among the inhabitants, and in the convict prison, attacking both the convicts and the prison anthorities. About this time the regiment quartered here was removed to Versailles, where the disease soon began to show itself amongst the garrison. In 1841 it died out here, but immediately after visited the capital, co-existing during the summer of 1842, with an epidemic of typhoid fever. While prevailing in Versailles it also appeared in three separate portions of the northern provinces, two of these being in the north-west, and one in the north-east. Thus, in 1840, we find the military, and, in the succeeding year, the townsfolk of Laval suffering; in the winter of 1840–41, the troops stationed in Le Mans and Chateau Gonthier, who had come thither from Laval, as well as the military and civil population of many of the surrounding districts, for example, Poictiers, Rambouillet, Blois, Joigny, and Tours; and, in 1842, the inhabitants and garrisons of Ancennes and Nantes. In the second portion of the north-western district, lying farther north, it appeared

[a] Cf. Stillé, p. 14.

[b] Cf. Boudin and Hirsch.

among the military at Brest, L'Orient, Caen, and Cherbourg. In the north-east, the garrison of Metz suffered in 1839, and that of Strassbourg in the autumn, winter, and spring of the following years (1840–41); nor did the inhabitants of the latter town escape the ravages of the disease. In many of the neighbouring districts also—for example, Schelttstadt, Hagenau, Buxweiler, Wasselone, Nancy, Colmar —it occurred amongst the troops, having been brought among them, it is stated, by the detachments which arrived from Strassbourg. This epidemic at Strassbourg is worthy of especial notice; indeed it marks an era in the history of cerebro-spinal meningitis, associated as it is with the labours of Tourdes,[a] whose writings then, for the first time, gave that impetus to the study of the disease which has since been so fruitful in its results. The second portion of southern France, from which the disease seemed to extend itself in 1837, lay on the east, in the provinces of Foix and Narbonne. In the ensuing spring it broke out with great violence among those dwelling in the plains of Hers, in the neighbourhood of Toulouse, and four years later among the inhabitants of this town and those of Aigues-Mortes. During this period it also attacked many of the garrisons stationed in the south-eastern districts; for example, those of Toulon, Nismes, Avignon—where it also prevailed in a severe form among the citizens—Perpignan, Montbrison, Pont d'Esprit, Marseilles—among the troops who had come from Algeria—and Lyons.

In 1843 cerebro-spinal meningitis seems to have almost disappeared from France, a few isolated cases alone remaining upon record. This state of things, however, was of short duration, for it again entered upon its dread course in 1846-48, revisiting, for the most part, the same districts where it had previously prevailed, and confining itself all but exclusively to the military, as in the preceding epidemic. We find it appearing among the garrisons stationed at Avignon, Lyons, Metz, Nismes, Toulouse, St. Etienne, Orleans, Bourges, Lille, and Paris; whilst a few cases only occurred among the civilians in Orleans, Corbeil, and Petit Bourg.

It is evident from these facts that the southern and northern portions of France, both on the east and west, pre-eminently suffered; whereas the high central plateaus were almost wholly exempted from the ravages of the disease. Hirsch well points out that in many instances it seems to have followed the course of the large rivers, especially that of the Adour, Rhone, Rhine, and Loire. The wide distribution of the epidemic may be judged from the fact that during the eight years of its career forty-nine outbreaks are recorded as occurring in thirty-seven of the eighty-six departments then comprehended under the name of France.

Soon after the outbreak of cerebro-spinal meningitis in France, in the

[a] Tourdes, G., Histoire de l'Epidémic de la Méningite Cerebro-Spinale, etc. Strassb. 1843.

winter of 1839-40, the disease showed itself in Italy, in the then kingdom of Naples, and in the following year spread throughout the surrounding Papal States. It appears to have first visited the districts of Mignano and Cervaro, in the Terra di Lavoro; next the Terra di Bari, Canosa, Spinazzola, Aquaviva, &c. In the Principato Ulteriore it spread very widely, as also in Rocca, Evandro, Eboli, Santo Margano, Frigento, Controne; in the districts of Basilicata, Melfi, Torcicollo, Pescopagano; in the parish of Martina, situated in the Terra d'Otranto; in the district of Naples; among the galley slaves in Procida; and lastly, in the great epidemic in Calabria Ulteriore, in Belcastro, Mesaruca, Ponte Corvo, Santo Valentino, Santa Agata de Gotis, Maida, &c. In the winter of 1843-44 it appeared in the district of Cotrone, in Calabria, and in the same year visited Sicily, continuing there till late in 1844. In September of that year reports from Palermo state that it had already visited Agliastro, Carini, and Caltanisetta, and that it was then prevailing in Terra Nuova. The last account of cerebro-spinal meningitis in Italy dates from the spring of 1845, when it was noticed afresh in the Terra di Lavoro and in the provinces of Alife and Piedmont.

From 1840 to 1847 it seems to have prevailed almost annually in Northern Africa, in several portions of the province of Algeria,[a] as much amongst the troops of the French garrisons as among the natives. In the beginning of the year 1840 it first appeared in the province of Constantine, in Setif and Bathna, and simultaneously among the garrisons at Douéra and Algiers. In the following year it entered Algiers itself and the neighbouring town of Bilhah, spreading amongst the civilians and garrison; and in the succeeding winter it was very widely diffused over the central and eastern portion of the French possessions in the provinces of Constantine and Algiers. In 1844 it visited the town of Constantine, and in the following winter Phillipsville, Douéra, and other places in both provinces. The last and most important outbreak occurred in the winter of 1846-47. It then appeared in many portions of both provinces—Algiers, Douéra, Medeah, Orleansville, Constantine—and even spread far and wide among the Arab population to the remotest parts of the country, Oran alone escaping.

While the disease was thus ravaging France and Algeria, in 1842, it visited, in the Western Hemisphere, several widely-separated portions of the United States[b]—Louisville, in Kentucky; Rutherford County, in Tenessee; and Montgomery, in Alabama. In 1845 it appeared in Mount Vernon and other places situated in the southern part of Illinois; in the winter of 1846-47 in the State of Arkansas; in 1847 in the States of Missisippi, Tenessee, Missouri, and Louisiana. In the spring of 1848

[a] Bertherand. Med. et Hygiène des Arabes. Paris: 1855.

[b] Cf. Ames, Chester, Hicks, Phillips, White, in New Orleans Med. Journ., 1847 and 1848.

it reappeared at Montgomery, in the State of Alabama, and spread throughout the neighbouring plantations. It broke out at the same time with great violence in the extreme west of Pennsylvania, and in the following year entered the States of Massachusets and New York. Finally, in 1850, it re-visited New Orleans, spreading widely among the black population.

Returning to Europe, we find the disease prevailing in Gibraltar and in Spain in the winter and spring of 1844.[a] This is the only record we have of its occurrence in this country. It is further worthy of remark, that it was, with few exceptions, confined to the civil portion of the population.

In the spring of 1845 the disease appeared in Denmark,[b] in the province of Jutland. The chief seat of the epidemic was Aarhuus in the district of Frysenborg; but cases were also observed in other parts of Jutland, as well as in the Isles of Funen, Laalland, and Zeeland, especially in Copenhagen. In the following years it visited Zeeland and many other places throughout the kingdom, nor did it cease to attract notice till the year 1848.

Cerebro-spinal meningitis visited the British Isles a year later than Denmark. In the winter and spring of 1846, it appeared in the majority of the workhouses of Ireland, especially in those of Dublin, Bray, and Belfast;[c] among the recruits stationed at the Constabulary Barracks, Phœnix Park, in Dublin; and in the spring of the same year in Liverpool,[d] and in Rochester,[e] in England. There is no further record of the disease till the year 1850, during which a remarkably mild epidemic seems to have prevailed in Dublin.[f]

Four years again elapse, during which we lose sight of cerebro-spinal meningitis. At the end of this period, however, in 1854,[g] it suddenly visited the Scandinavian Peninsula,—a portion of Europe which had hitherto wholly escaped its ravages—with an almost greater violence than any of the countries previously attacked. This holds good in an especial degree regarding Sweden, almost the entire of which the disease overran during the following seven years, whilst it only appeared in Norway in 1859, at a time when it was dying out in Sweden.

Hirsch has drawn attention to a peculiar feature connected with the spread of the disease in Sweden. The epidemic, issuing from the southern and south-western portion of the country seems to have advanced annually further in a northerly direction; so that the places

[a] Thompson and Gillkrest, in Lond. Med. Times and Gazette, 1844 and 1845.
[b] Ditzel and Uldall, in Biblioth for Läger. 1846.
[c] Mayne, in Dublin Quart. Jour. 1846. R. W. Smith, Parliamentary Report.
[d] Whittle in Lond. Med. Gaz. 1847, iv., p. 807.
[e] Browne in Trans. of Epidemiological Soc. Vol. ii.
[f] M'Dowel in Lond Jour. of Med. 1851.
[g] Cf. various writers in Hygiea. 1859 and 1863.

previously attacked were, in the following year, almost wholly exempted. the southern boundary of the new sphere of the disease, nearly, or rather exactly, corresponding with the northern limit of the previous year.

In the spring of 1854, isolated cases were met with in Götheborg, and towards the close of the year, in the governments of Bleckinge and Kalmar. It was not, however, till the first half of 1855 that the disease became widely diffused, and assumed the character of an epidemic, spreading northwards throughout the eastern portion of Bleckinge, until it reached the town of Kalmar, upon the shores of the Baltic Sea. Simultaneously small isolated epidemics were observed in portions of the provinces of Jönköping, Christianstad, Bohus, and Södermanland. During the latter half of the year 1855, the disease entirely disappeared from Kalmar; but in the spring of 1866, it reappeared to the north of this town, and spreading throughout the provinces of Jönköping and Oestergöthland, finally reached Philipstad, in Wermland, more than $1\frac{1}{2}^{\circ}$ north of Kalmar. Bleckinge, Bohus, Götheborg, Elfsborg, Oerebro, and Wermland also suffered. In May it again died away, nor did it return during the remainder of the year. The commencement of the new year, however, was the signal for a fresh outbreak. Issuing from the eastern banks of Lake Wener, and passing through the northern portions of the province of Skaraborg, and northwards from Lake Wetter, through the southern portions of Oerebro to both sides of Lake Mälar, through the northern portions of Södermanland, and the southern of Westmanland, it well-nigh arrived at Upsala and Stockholm. The southern provinces—Kalmar, Jönköping, Linköping, Götheborg, Bohus, and Stora—also bore their share of the epidemic. Having thus advanced 2° northward, it subsided in June only to re-appear in 1858 with still greater violence, visiting Upsala, Westmanland, Oerebro, Wermland, Stora, Gefleborg, spreading more than $1\frac{1}{2}^{\circ}$ northward, as far as Sundwall. Numerous isolated cases also occurred in Malmöhus, Christianstad, Götheborg, Jönköping, Oestergöthland, Skaraborg, Elfsborg, Södermanland, Westernorrland, and Jämtland, and a very widespread epidemic prevailed in the province of Kronoborgs—a province situated in the extreme south of the country, which had till that time escaped. In 1859, a very striking difference and diminution was perceptible, not alone in the universality of its diffusion, but also in the magnitude it attained in isolated places. Stora and the province of Gefleborg may be taken as the main foci this year; whilst smaller isolated epidemics were observed in Upsala, the province of Skaraborg, and throughout the southern portions of the country. In the following year, 1860, the course of the disease was still more circumscribed, small outbreaks alone occurring in the province of Oerebro, on the northern shores of Lake Wetter, with some isolated cases in other parts of the country. Finally, in 1861, the malady entirely died out in Sweden, sporadic cases alone being recorded.

Of the twenty-four governments or läns of Sweden, during these seven years this remarkable epidemic is recorded to have exempted only two—Westerbotten and Norrbotten—lying in the extreme north. In two of the northern governments which lay next to these—Westernorrland and Jämtland—and in two of those in the south—Gothland and Halland—sporadic cases only had occurred; but throughout the eighteen remaining governments, the epidemic had annually prevailed more or less widely, sweeping away in the seven years no less than 4,138 of the inhabitants.

In Norway, as previously stated, the disease did not appear till 1859. A small but very malignant epidemic then occurred at Opdal, visiting, in the following year Rangsacken, in the same province. With this brief notice, the only record possessed of the Norwegian epidemic, we pass on, merely glancing at a local outbreak of the disease among the garrison in Arnheim, in the Netherlands, in the winter of 1860-61. In the same winter cerebro-spinal meningitis was observed in Portugal,[a] in the hilly districts near the Spanish boundary, at Montforte, whence it spread southwards in a very irregular manner, visiting both Oporto and Lisbon.

It is a curious fact that, though from 1837 the disease was in such close proximity to Germany, it did not obtain a firm footing in this country till 1863. We have the authority of Hirsch, the eminent German historiographer of this disease, for stating, that though in the early part of the present century certain epidemics classed under the title of "acute hydrocephalus" and "encephalitis," are on record, the only reliable information concerning the occurrence of cerebro-spinal meningitis in Germany, before the year 1863, dates from Würzburg, where a number of cases were observed in the hospital and town in the summer of 1851.

In the summer of 1683, cerebro-spinal meningitis broke out in Silesia, at Liegnitz and Neissethale, and, in the spring of the following year, made very considerable ravages amongst the children at Bromberg and Stettin, and among the military and citizens of Berlin. In the winter and spring of 1864–65, it travelled over a large portion of Lower Pomerania, even up to the bounds of Western Prussia, where it became united with the epidemic which had meanwhile broken out there. A few cases also occurred at Czikzyn[b] in December, 1864, and at Graudenz and the surrounding neighbourhood, in the beginning of 1865. Later on in the same year the districts of Behrent, Carthaus, Elbing, Stargardt, Neustadt, the insulated lands called the Nehrung, lying between two branches of the Vistula and the sea—all situated in the

[a] Gaskoin in Lond. Med. Times and Gaz., 1865. Marques in Brit. and For. Med. Chir. Review, 1863. April, p. 389.

[b] Cf. A very able Report upon the Epidemics of Cerebro-Spinal Meningitis prevailing about the lower vistula by John Burdon Sanderson. Parliamentary Paper. No. 435. 1865.

department of Dantzig—the town of Dantzig itself, and its extramural district suffered considerably, the epidemic moving in an easterly direction along the banks of the Vistula and the sea-coast. It also attacked many children and adults in the districts of Konigsberg and Potsdam. In Hanover it appeared in the spring of 1864, in Emden and its environs, and in the following winter and spring visited several places in this kingdom, and in the Duchy of Brunswick. In middle Germany cerebro-spinal meningitis was for a short time observed in Leipzig in 1864. It then died away to reappear during the following winter[a]; and at the same time it attacked Eisenach with great violence, spreading east and west of this town for some distance. Simultaneously during the winter and spring of 1864-65, the disease made considerable progress in Southern Germany, reaching its height in Bavaria, parts of which—for example, Erlangen[b] and Nürnberg—it had visited the previous year; in Hesse, in the district of Gadensberg, Neukirch, and Sontra; and in Baden, in the districts of Rastadt,[c] Carlsruhe, Freiburg, Gengenbach, Offenburg, Säckingen, Constanz, Donaueschingen, Durlach, and in the city of Baden-Baden. It also appeared in the greater part of the south of Bavaria, and in the various palatinates of Franconia; visiting in Upper Franconia the districts of Ebermanstadt, Neila, Forckheim, Kronach, Pottenstein, Bayreuth, Bamberg, Hof, Lichtenfels, &c.; in Middle Franconia, the districts of Erlangen, Hersbruck, Nürnberg, Fürth, Neustadt, Scheinfeld, Uffenheim, Ansbach, Heilbronn, and Schwabach; in Lower Franconia the districts of Schweinfurt, Karlstadt, Rothenbuch, Ochsenfurt, Aschaffenburg, Lohr, Arnstein, Hammelburg, and the districts of Auerbach, and Eschenbach. Augsburg, Türkheim, Oettingen, Regensburg, Landshut, and Munich also suffered during the spring of 1865, and reports reach us of the prevalence of the disease even in many parts of Austria and Hungary.

In the western hemisphere, cerebro-spinal meningitis had remained in abeyance from 1850 to 1856, when we hear of it at Salisbury, in North Carolina; and in the following year in the western and central portions of New York and Massachusets.[d] Within the past few years, however, the disease appears to have extended itself more widely, frequently showing itself among the soldiers of the Federal army, in the winters of 1861-62,[e] and during the same season invading Missouri, Indiana, Kentucky, and Connecticut, numbering among its victims soldiers and civilians alike. During the ensuing winter it visited the troops

[a] Wunderlich in Archiv. der Heilkd., 1864 and 1865.

[b] Ziemssen, Men. Cerebro-Spin. Epidem., 1865.

[c] Niemeyer die Epidemische Cerebro-Spinalis Meningitis. Berlin, 1865.

[d] Cf. Thomas Squire, Saunders and Kendall, in Trans. of State Med. Soc., of New York, 1858. Dickson and Summerhill in Trans. of Amer. Med. Assoc., xii. and xiii.

[e] Cf. Watson, Woodward, Draper, Frothingham, in Amer. Med. Times, 1864.

encamped in, and around Newbern, in North Carolina, and also the negro soldiers who had come with the Federal army to Memphis. Cerebro-spinal meningitis appeared simultaneously in many other states also, in the winter of 1862-63, in La Grange County, and other northern portions of Indiana; in 1863, in Rhode Island and Pennsylvania; in the winter and spring of 1863-64, in Philadelphia; and in many of the northern portions of Pennsylvania, New Jersey, and Ohio; and in 1864 in Vermont and Illinois. During the same period[a] it prevailed in Maryland, Virginia, North Carolina, Alabama, and other Southern States; and evidence is not wanting of its annual occurrence in Philadelphia up to the close of the past year.

To return to our own isle, a remarkable fatal type of the disease appeared in Dublin in March 1866,[b] since which, up to the present time, it has continued to prevail. Outside the city the distribution of the disease has been more or less limited, a few cases only having been reported as occurring in the provincial districts[c] of Celbridge, the Curragh Camp; Naas, in the parishes of Naas, Rathmore, Blessington, and Ballymore; Ballyboggan and Edenderry, in the Edenderry Union; Tullamore, Parsonstown, Templemore, Thurles, Carrick-on-Suir; Tipperary, in the parishes of Emly and Golden; Bagnalstown[d]; Bridgetown, in the Wexford Union; Kilmacthomas,[e] in the County Waterford; Cork, in the Ballincollig and Carignavar Unions; Macroom, Mitchelstown; Killadysart and Ennistymon, in the County Clare; Galway; Trim, and Dunboyne, in East Meath; Drogheda, Dundalk, Ardee; Kilkeel, and Lisburn, in the County Down; Glendermot and Ballymoney, in the Unions of Londonderry and Kilrea; Clondalkin, Rathcoole, Tallaght, Rathmines, Palmerston, Donnybrook, Sandymount, Kingstown, and other parts of the County Dublin. Not a few of these cases occurred among the soldiers[f] quartered in Dublin, at the Richmond and Royal Barracks, and at the Cavalry Barracks, Island-bridge; at the Curragh Camp; and, in a remarkable manner, among those detachments of the "Flying Column" stationed at Birr, sent to check the movements of the Fenians in the early months of 1867.

Cerebro-spinal meningitis has never become epidemic in England. Indeed, so rarely has it been observed there, that the fact of its occurrence

[a] Morrill, Levick, Jewell, Atlee, in Amer. Journ. of Med. Science, 1864. Black and Burns, 1865; Stillé, 1864, 1865, and 1866; Sargent, 1849, &c.

[b] Cf. Gordon, Banks, Law, Wilson, and Report of May Meeting in 1867, at Coll. of Phys., in Dub. Quart. Jour., 1866-67; Banks, Croly, Gordon, Haverty, Law, Hayden, Kennedy, Lyons, M'Dowell, Moore, Stokes, in Dub. Med. Press and Circu. 1866-68, &c.

[c] *Vide* Quarterly Returns of the Registrar-General of Deaths, for 1866-68.

[d] Frayer, J., in Med. Times and Gaz., 1867. Vol. ii., p. 511.

[e] Private information from H. Green, M.D.

[f] Report by Staff-Surgeon Marston in Med. Times and Gaz. Vol. ii., 1867.

in that country might almost be passed over in silence. In 1807, Gervis,[a] of Ashburton, reported four cases. Scott[b] states that he saw cases of a similar nature at Sunderland, in 1830; and Richardson,[c] one at Mortlake, in Surrey, in 1843. A few were noticed in 1846, at Liverpool, by Whittle, and at Rochester, by Browne; at Stafford, in 1859, by Day;[d] in 1867, at Bardney, in Lincolnshire, by Lowe[e] and Woolley;[f] at Devises by Clapham;[g] and at Chelsea by Crisp.[h] In the metropolis a single case was observed by Wilks, in each of the years 1856, 1858, and 1859;[i] seven cases, in 1865, by Wilks, Ogle, Murchison, and Martin; a few,[k] in 1866, by Murchison, and Baümler; one, in 1867, by Clarke, and in 1868 by Wilks.

If we now glance at the diffusion of cerebro-spinal meningitis upon European soil during the present century, we find that Turkey, Greece, Belgium, Scotland, Iceland, and Russia alone, so far as our present limited information warrants such an assertion, have remained unscathed. Outside of Europe we hear of the disease only in Canada, the United States of North America, and the North Western shores of Africa.

In the foregoing brief history of the appearance and diffusion of cerebro-spinal meningitis, many peculiarities are noticeable, which essentially distinguish it from other epidemics. Its simultaneous appearance in places widely separated, so widely separated indeed as to have no channels of intercommunication; the singular exemption, during an epidemic, and subsequently, of the intermediate, and frequently of the surrounding districts; its occurrence, whether in numerous or isolated cases, simultaneously or otherwise, in many separate quarters of the same locality without any effort at concentration; the great variableness of its duration, of its extent, and of its intensity; the irregularity of its progress; its fluctuating character, manifested in frequent exacerbations and remissions, with too often all absence of any gradual increase or decline; its generally admitted non-contagious, or very slightly contagious nature; and its independence of all geographical limits, local causes, or indeed as yet of any appreciable causes whatever, constitute it truly a disease, *sui generis.*

[a] Med. Chir. Trans., 1811, ii., p. 234.
[b] Lond. Med. Times and Gaz., May, 1865.
[c] Social Science Review, May, 1865.
[d] Clinical Histories, 1866, pp. 3-7.
[e] Lancet, 1867, p. 790, Vol. i.
[f] Lancet, 1867, p. 130, Vol. ii.
[g] Med. Times and Gaz., Vol. i., 1867, p. 709.
[h] Med. Times and Gaz., June, 1867. [i] Lancet, April, 1865.
[k] Murchison in Med. Times and Gaz., Vol. i., p. 483, 1867. Baümler in Med. Times and Gaz., Vol. ii. p. 58, 1867. Clark in Lancet, July 13th, 1867. Wilks in Med. Times and Gaz., May, 1868.

So many and so varied are the guises assumed by cerebro-spinal meningitis, owing to the varieties in form, grouping, severity, and number of the individual symptoms and physical signs, that it seems difficult to form with success any classification which would comprehend established types, definite stages, or even certain varieties in form of the disease. Many such attempts have, indeed, been made; yet, the phenomena which characterize these types, stages, and forms, are so frequently, in part or altogether, wanting, or commingled, that such artificial classifications are calculated to prove barriers rather than helps to the study of the disease. In this report, therefore, we will confine ourselves to a brief account of the individual symptoms and signs, taking them in the order of their occurrence, as far as this is at all possible, and with the aid of such illustrations as may have occurred within our own sphere of observation.

It has been observed that in a large proportion of cases the malady suddenly manifested itself with more or less severity without any premonitory symptoms, frequently setting in during the night; or the patient was suddenly seized during the day while following his ordinary avocations, in the midst of work, during meals, in the street, while at school, or at play, with shiverings, vomiting, and headache. A boy, aged eleven, who died in the Meath Hospital during the present year from this disease, gave the following curious account of the commencement of his illness:—Coming home in the middle of the day, he stated that while out he had been frightened by the vision of a black man, "so tall that he could not see the top of his head;" that this man had in some way menaced him, and that in consequence he had run home. Immediately after he began to complain of intense pain in his head, and the disease ran its fatal course in sixteen days. The duration of premonitory symptoms, when they occur, is very variable, lasting from a few hours to as many days. Among these symptoms are—headache, stiffness of the neck, a feeling of formication, giddiness, rigors, great prostration of strength, great pain in the abdomen, and, above all, vomiting. Regarding the time at which the disease first manifested itself, such contradictory statements exist that, upon this point, no definite conclusions can be formed; nor is this a matter of much regret.

The rigor which ushers in the disease, though usually the precursor of an increase of temperature, too frequently is succeeded by a state of collapse, during which the characteristic signs of the malady develop themselves. When this does not happen these signs appear gradually, or more rapidly, the greatest difference being observed in the time of their occurrence. Of them, whether as regards priority, constancy, prominence, or persistence, pain in the head undoubtedly ranks the first. Its distribution, character, and violence varies much in different cases; sometimes, too, it is influenced by posture and by pressure. It generally

continues, not alone throughout the whole course of the illness but far into the stage of convalescence, oftentimes exhibiting a distinctly remittent or intermittent character; and a return of this symptom, in company with those of vomiting and convulsions, but too frequently points to the issue of the disease in hydrocephalus—facts which receive ample conformation in the case of the boy Dooley. It must, however, be borne in mind that, though in many cases persisting throughout, it bears no proportion to the violence of the other symptoms, being only slightly marked in some rapidly fatal cases, while in others of a much milder nature it is observed in its greatest intensity.

Vertigo is not unfrequently associated with headache. A curious case of rotatory convulsions from this cause is recorded by Forget,[a] and other observers have found it occasionally highly marked. In connexion with this case of rotatory convulsions, it may be stated that the experiments of Brown-Séquard go to prove that they often depend upon irritation of certain portions of the auditory nerve, medulla oblongata, pons Varolii, and other parts of the base of the encephalon. Delirium is generally noticed in severe cases, though presenting many varieties in degree and form. It seldom continues during the whole illness, vanishing and again returning and alternating with other symptoms. The character of the delirium is frequently furious, so that the patient can only be kept in bed by the imposition of some restraint. At other times he lies still, muttering disjointed words and sentences, easily awakened when sharply addressed, but again relapsing when left to himself; or it may assume the form of illusions from which the patient may only awaken to find himself convalescent. In the *foudroyante* form it is sometimes wanting, the patient quietly sinking into coma and continuing in this condition till he dies.

A general state of restlessness, and more or less persistent loss of sleep, are symptoms also deserving of notice—so much so, indeed, that the occurrence of a long and quiet sleep has come to be regarded as of decidedly favourable import.

At the commencement of the illness, particularly in the rapidly-fatal cases, coma sometimes stands out so prominently as to have obtained from some writers[b] a special acknowledgment under the designation of "comatose cerebro-spinal meningitis," the patient sinking into a state of utter unconsciousness, and either soon succumbing or waking in delirium at a later period. Occurring at a more advanced stage of the disease, and ushered in by violent headache or delirium, it frequently passes off to be succeeded by a fresh attack of delirium; and continual alternations of coma and delirium may thus be observed. When unbroken, however, especially when it is accompanied by signs of paralysis, its unfavourable omen is generally too manifest. Of the few cases which have emerged

[a] Gazette Médicale de Paris, 1842, No 15-20.

[b] Tourdes, Forget, &c.

from this condition, as complete consciousness returned, some, oblivious of their previous sufferings, have found that in the course of their malady they have become paralysed; others that they are bereft of sight or of hearing, or even of both together; while others, again, that they are so morbidly sensitive that light and sound and all other external impressions are painful; or even, escaping these consequences, that they are in a wretched state of weakness from which they very slowly recover. In not a few instances, however, the stupor is imperfect, and is hardly deserving of so strong a name.

One of the most characteristic symptoms which accompanies the headache is pain in the spine. At first generally manifesting itself by more or less pain and stiffness of the neck, it is, in many instances, wholly confined to the cervical region. Indeed, though often uniformly diffused over the whole spine, it seldom has for its special seat either the dorsal or lumbar regions. The rhachialgia is generally increased by movements of the head or body, or by pressure upon, or at the side of, the spinous processes of the vertebræ, especially in the cervical region. It may last throughout the whole course of the disease, or be limited to its early periods; or again, it may continue even after convalescence, as in the cases recorded by Niemeyer and Hirsch. The fixed or flitting pains experienced in the limbs and body stand evidently in close relation with the pain in the spine, often seeming to radiate therefrom, and even sometimes being produced by pressure upon the spinous processes. Acute pain in the knee was particularly complained of in several of the cases which came under our notice; and this symptom has been dwelt on at considerable length lately by an American physician[a] in connexion with ordinary meningitis.

The pains in the spine and limbs, indeed, are sufficiently remarkable, but still more so is that tetanic condition of the cervical muscles which frequently is their accompaniment. Foreshadowed in many cases by a stiffness of these muscles, so striking and so constant are the phenomena thus presented in their full development that in Germany and Sweden they have given a designation even to the disease itself—(Nackenstarre, Genickkrampf, Nacksjuka, &c). The contraction sometimes proceeds so far that the head is retracted, so as almost to form a right angle with the spinal column; and any attempt to bend it forwards is attended with the liveliest feelings of pain on the part of the patient. From this extreme retraction of the head to simple rigidity or stiffness of the neck every degree of contraction may occur; and so frequently is this phenomenon exhibited that it has justly been regarded as the most characteristic sign of the disease, no less by those within than by those without the profession. An enumeration of the various descriptions of this sign adopted by those who have witnessed cerebro-spinal meningitis in the many

[a] Fisher.

countries where it has prevailed would leave no doubt whatever upon this point. Indeed, it is owing to this characteristic that the disease has been, and is capable, in many instances, of being accurately distinguished from the numerous diseases with which it has from time to time been confounded, and under whose names it has been described. Within the last few years an interesting question has been started by Burdon-Sanderson. In his able report[a] upon the North German epidemic he has endeavoured to show that this contraction of the cervical muscles is a direct consequence of the pain that is so frequently complained of in this region. We do not hesitate to affirm our disbelief in this theory; for no circumstance, as Hirsch remarks, is more evident than that the severity of the spasm and of the rhachialgia bear no relation whatever. Not long since, indeed, we had an opportunity of witnessing an ample confirmation of this fact, which in many respects was so remarkable that it seems worthy of notice here.

Mary Anne Crispie, aged six, came home from school, complaining of violent pains in her head and belly. These symptoms, that night, were followed by vomiting and delirium, with intense heat of skin. Four days subsequently, when visited by her medical attendant, she was found lying with her head far retracted, so as to form well-nigh a right angle with her body, tossing herself about very restlessly, and extremely sensitive to the slightest touch. She was admitted into the Meath Hospital upon the eighth day from the commencement of her illness. The only signs she then presented—and they were sufficiently characteristic—were extreme retraction of her head, with rigidity of the deep cervical muscles, so that her face was directed upwards towards the head of the bedstead upon which she lay; slight elevation of temperature (101°), and of the pulse (100); considerable opisthotonos; and an eruption of a few vesicles of herpes on the lips. She complained of no pain whatever in the region of the neck or back, and, when asked the question, stated that there was none; nor, during the remainder of her stay in the hospital, which lasted over a fortnight, did such pain ever occur, save, as might be imagined, when endeavours were made to bend the head forwards. The opisthotonos disappeared, and the retraction of the head gradually diminished, undergoing at times well-marked exacerbations and remissions. She was removed from the hospital finally, at the wish of her friends, still having her head slightly retracted, but otherwise exhibiting no sign of the disease.

The retraction of the head seems to be only a variety of the other tetanoid phenomena, such as opisthotonos, pleurosthotonos, emprosthotonos, and trismus, which less frequently exist. The opisthotonos sometimes is so marked that, as happened in a case under the care of Dr. Gordon, and another under Dr. Stokes, the patient lay on the

[a] Page 12.

abdomen, and refused to be moved from this position. In the first of the two remarkable instances here alluded to, not only the spine, but the head also, was retracted to a wonderful degree; and as so frequently, not to say invariably, happens in similar cases, all changes of position were resisted on account of the violent pains in the spine and other parts of the body, occasioned thereby. The contraction and stiffness of the neck continue usually, with more or less uniformity, during the whole course of the illness, sometimes even far into convalescence, remitting perhaps, or intermitting, and, in not a few instances, have long persisted after all other traces of the disease had disappeared. The same uncertainty of duration characterises the opisthotonos, as indeed, all the other signs of cerebro-spinal meningitis, cases being recorded by Hirsch, and more recently by Stokes[a], of its persistence during even the fourth and sixth week of the malady.

With regard to the cause of these tetanoid phenomena, Stillé, in his recent treatise, has asserted that these, together with the rhachialgia, "orginate in the same spinal lesions, congestion of the membranes of the cord, or its compression by an effusion of serum or of lymph, or by changes in its proper tissue." We cannot concur in this opinion, as, even in our own experience, cases have occurred unattended by any opisthotonos or contraction, or even stiffness of the neck, although the exudation upon the membranes of the brain and spinal marrow was singularly profuse; and the converse of this proposition is equally true. Nor can it be imagined that mere congestion of the cord or its membranes is sufficient to produce these phenomena; as, if such were the case, they should generally be present in cases of *meningite foudroyante*—those cases of all others in which they are absent—where the morbid appearance almost invariably presented is congestion, of varying degree, of the cerebral and spinal pia mater, and of the brain and spinal cord. Moreover, in tetanus it has often happened that no lesions whatever have been found after death, even by very experienced observers.

Trismus, as also local or general tonic spasms are often associated with these phenomena. The chief seats of spasm are the muscles of the upper, and less frequently those of the lower, extremities, and the muscles of the face, causing the peculiar expression of countenance so characteristic of tetanus. The patients almost invariably lie upon their side, with the thighs spasmodically flexed upon the abdomen, and the legs upon the thighs. So powerful sometimes is the spasm, that the anterior part of the thighs comes almost in contact with the abdomen, while the heels are drawn up, so as to touch the back part of the thighs. We have particularly noticed this during the recent epidemic, and cannot but regard it as one of the many signs referable to the spinal affection.[b]

[a] Vide proceedings of Coll. of Phys. in Dub. Quart. Journ. Aug. 1867, p. 226.

[b] Cf. Brown-Séquard. Phys. of Nerv. Syst., p. 114.

Convulsions have also been observed, though less commonly than tonic spasms. They vary greatly in degree, being either confined to single groups of muscles—for example, those of the face, eyes, or extremities—or attacking simultaneously various portions of the body, or even appearing as general or epileptiform convulsions. Sometimes occurring on one side of the body only, they are associated with paralysis of the opposite half. Sometimes, again, as Schuchard[a] has pointed out, they are purely reflex, being occasioned by violent movements of the patient, a blast of wind, a bright light, or the mere touch. Even when general, they are not necessarily of fatal augury; for, they often occur at the commencement of the attack in patients who recover, and Hirsch has observed them as frequently in mild as in severe cases. On the other hand, a long continuance of convulsions is a very unfavourable sign, as well as their occurrence at a late period, as previously remarked. Not long since a remarkable morbid specimen of the disease was submitted to the Pathological Society of Dublin, by Dr. Stokes, which would not here be noticed were it not that the case presented the very striking phenomenon of continued and violent convulsions during the whole of the brief course of the illness. Such cases, from their exceeding rarity, are well deserving of special notice. A similar case is not alluded to, in so far as we have been able to discover, in any of the works of those who have had the largest experience of the disease.

Paralyses are not of common occurrence. Many authors have not even mentioned them; while others draw attention to their rarity despite the anatomical lesions. Ptosis, strabismus, paralyses of the bladder and rectum, of the muscles of deglutition, articulation, and of the extremities, facial palsy, hemiplegia, paraplegia, and even general paralysis have been observed. Aphasia, also, has been recorded by Hirsch and Hayden. Slight and temporary paralyses of single portions of the body have at times appeared early, but they generally show themselves at a much later period, while general paralysis is usually the immediate precursor of dissolution. Wunderlich, however, records an interesting case of a man who, on the second day of his illness, became the subject of partial paralysis of the left arm, as well as of complete loss of motion and sensation in the lower extremities and over a large portion of the body. Even thus the man did not succumb, nor did the paralysis quickly disappear, for we are told that five months afterwards he had only partially regained his muscular power. Other writers likewise report cases where the paralysis of the extremities continued as a sequela of the illness for a long period.

Affections of the special organs of sense, when they occur, are among the most striking and distinctive phenomena of cerebro-spinal meningitis,

[a] Hannov. Zeitschr. für Heilkd. 1865, p. 263.

placing it in very marked contrast with the continued fevers, with which it has too frequently been confounded.

Foremost among these complications are the affections of the eye and its appendages. Wilson has drawn attention to the enormous swelling of the eyelids which sometimes occurs. This seems to be only one of the results of the intense conjunctivitis which has so frequently been observed in many of the foreign epidemics, as well as more lately in Dublin. Too frequently, however, it happens, that conjunctivitis and interstitial keratitis are only the harbingers of still deeper seated mischief of the most formidable character, partaking of the nature of choroido-iritis, and resulting in opacity of the lens or of its capsule, with synechia posterior or closed pupil, separation of the retina from the choroid by serous effusion, choroidal degeneration, obscurity of the media, with sometimes purulent infiltration, and even atrophy of the globe. It need hardly be stated that under these circumstances blindness generally results; and when we consider the violent character of the choroido-iritis—for this is the inflammatory condition affecting the deeper structures which most frequently is met with—and the many consequences it entails, it is not to be wondered at that comparatively few of these cases recover without more or less loss of vision. The following remarkable instance of this affection came under our notice:—

Mary Hastings, aged fifteen, was admitted into Sir P. Dun's Hospital in a state of partial stupefaction on the first day of her illness, having been suddenly attacked with intense headache, persistent vomiting, and a feeling of pain and constriction on the right side of her chest. On the following day the peculiar dark purplish eruption, slightly raised and indelible on pressure, which has so frequently been observed during the recent epidemic, had made its appearance upon various parts of the body, more especially upon the legs, thighs, aud forehead. Upon the fourth day stiffness of the neck and retraction of the head, with rigidity of the deep cervical muscles, manifested themselves; and as on the previous day the patient lay upon her abdomen, occasionally moaning, muttering, and tossing herself about uneasily; nor could she be induced to move from this posture. On the fifth day both wrists and the left elbow joints appeared red, swollen, and tender, apparently from effusion into the joints as well as into the surrounding tissues. Intense injection of the conjunctiva, with swelling of the eyelid, but without any increased secretion of mucus; patches of interstitial opacity of the cornea; discoloration of the iris, with some opacity of the capsule of the lens; and blindness of the left eye, unattended with any pain, had suddenly supervened. The right eye was perfectly normal. She was also very deaf. The following day the cornea had become more opaque; pus lay in the bottom of the anterior chamber; the iris was duller and more discoloured; the pupil small, irregular, and unaffected by a strong

solution of atropine; and the capsule of the lens still more obscure. Suffice it to say that almost complete blindness of this eye resulted, the pupil remaining small, irregular, and more or less adherent to the opaque capsule of the lens. The deafness on both sides, unaccompanied by any pain or purulent discharge from the ears, increased. Her left knee became swollen and tender, and she finally fell into a state of extreme marasmus. Exacerbations and remissions of the febrile symptoms frequently manifested themselves. Erysipelas of the head and face supervened towards the close of the illness, and her convalescence was extremely protracted. In the end, after a stay of four months, she recovered, and quitted the hospital nearly blind of the left eye and completely deaf. At the present date, a year subsequent to her illness, the pupil of the left eye is much smaller than that of the other, and is only very slightly influenced by light. Under the influence of atropine it enlarges to a considerable extent, but its edge is extremely irregular owing to adhesions. Viewed by transmitted light the capsule of the lens is opaque, and the opacity is greater in some points than in others. No illumination of the fundus results when light is thrown upon the pupil from the mirror of the ophthalmoscope. Examination of the state of the fundus, therefore, is not possible. She has, however, partially recovered her sight, and is able to distinguish the outline of objects held close to her. The deafness on both sides is as complete as ever, and the site of many of the spots is evidenced by a perceptible pitting of the skin.

It is noticed by one writer[a] that in all his cases the right eye was the one affected. The case here related is, however, a sufficient proof that the right eye cannot be considered as the only one which may be the subject of inflammation. We have in other cases also witnessed the results of this terrible affection upon the left eye. Amaurosis, temporary or permanent, is not an uncommon sequence of the disease; nor should this be a matter of surprise, as it has been shown by Mampe, Kreitmaër,[b] and more recently by von Gräefe,[c] to depend frequently upon exudative choroiditis and consequent detachment of the retina. We have also seen cases in which this symptom was apparently dependent upon atrophy of the optic nerve of cerebral origin.

Various opinions have been advanced regarding the cause of these inflammatory conditions of the eye. Wilson is inclined to attribute them to metastasis such as he has observed in puerperal fever and other pyemic affections. Others regard the conjunctivitis as the result of lagophthalmos. A fatal objection to the universality of such a theory is that, in many cases, as in that of Mary Hastings, no such lagophthalmos

[a] Wilson. Dub. Quart. Journ., May, 1867.
[b] Bayr. ärztl. Intelligenzbl. 1865, No. 30.
[c] Verhandl. der Berl. Med. Gesellschaft I., p. 58.
Die Epidem. Cer. Spin. Meningitis. Berlin: 1865.

existed. But we do not deny that such may sometimes, yet we believe rarely, be the cause of the inflammation of the conjunctiva and cornea. Von Gräefe considers the choroiditis as the direct result of the spread of the purulent infiltration from the cavity of the cranium along the optic nerve; while Niemeyer, of Baden, regards all these various affections of the eye as the result of alterations of its nutrition, owing to the extension of the inflammation to the neurilemma of the trigeminus. He points out that the inflammatory changes in the eye, which have been enumerated, are exactly equivalent to the results which have been experimentally obtained by section of the Gasserian ganglion. The acceptation of this exceedingly ingenious explanation, however, is not unattended with difficulty. One would imagine, on anatomical grounds, if this theory be correct, that more or less facial anesthesia on the same side should also result. Yet such is not the fact, for we ourselves have witnessed the two opposite conditions in this disease of ocular inflammation without facial anesthesia, as in the case of Mary Hastings, and again of facial anesthesia without ocular inflammation, as in the case of Thomas Devine.

In the notice of the paralyses allusion has been made to strabismus and ptosis, which are the most frequent of these lesions of motion. During the epidemic in North Germany Burdon-Sanderson observed twelve cases of temporary strabismus, in eleven of which it was convergent. Double vision existed in all. In other epidemics even triple vision has been noticed. Divergent strabismus has been met with by Banks and others; and even both eyes have been found affected. In some epidemics strabismus has been much more frequent than in others; thus it was in the epidemic at Dantzig, whereas in the epidemics at Strassbourg, Baden, and lately in Dublin, it was uncommon. It appears to be dependent upon local lesions affecting the third and sixth nerves, which supply the recti muscles of the eyeball, due either to inflammation by continuity of their neurilemma, or more probably to the effects of pressure or contraction of the exudation which is found enveloping them. Ptosis, from lesions of the third nerve, is even more common than the strabismus with which it frequently is associated. Of the sixteen cases recorded by Mannkopff[a] in his recent memoir, two exhibited this phenomenon on the second and third days of the illness. In one case the ptosis was accompanied by convergent strabismus upon the same side, while in the second the same form of strabismus affected the opposite eye; in other words, lesions of the third and sixth nerves, on the same and on opposite sides respectively, coexisted. Ziemssen of Erlangen also has observed numerous instances of lesions both of the oculomotor and abducent nerves. Lagophthalmos from paralysis of the orbicularis

[a] Über Mening Cerebrospinalis Epidem. Braunschweig, 1866, p. 146, 147.

palpebrarum, generally transient in character, has also, in some rare instances, been met with in connexion with Bell's paralysis. This was noticeable in the case of the girl Mary Frances. The rarity of these paralyses during the recent epidemic may be judged from the fact that, among the thirty-seven cases placed on record at the May meeting of the Medical Society of the College of Physicians last year, only two instances of partial strabismus, one of partial ptosis, and two of incomplete facial palsy are alluded to. It remains to notice the condition of the pupils. As is the case in other cerebral affections, this is far from constant. They may be either dilated or contracted, or one contracted and the other dilated, or again, perfectly normal. No condition then of the pupil is peculiar to the disease, save, perhaps, the condition of sudden alternate dilatation and contraction, as noticed during the early American epidemics.

Affections of the organ of hearing are far from uncommon. According to some writers they are decidedly more frequent than disorders of vision. Tinnitus, and pain in the ear, attended with difficulty of hearing, are sometimes experienced early, and later on deafness, with or without pain, tinnitus, or otorrhea. This deafness in one or both ears, like other symptoms, often appears to vary considerably from day to day, and it either slowly passes away or remains as one of the incurable sequelæ of the malady. In many cases it cannot be accounted for by any changes in the membrana tympani and external ear; but the state of this membrane has unfortunately been little attended to, owing to the neglect of the use of the speculum. Acute otitis, or inflammation of the lining membrane of the cavitas tympani, was once observed by Ziemssen on the twenty-fifth day of the illness. On the thirty-sixth, the pent-up matter, having burst through the membrana tympani, was discharged externally. Cicatrization of the opening in the membrane subsequently took place, and slight difficulty of hearing only remained. We had an opportunity of watching but one case in which deafness on both sides manifested itself early. In this instance the deafness was unaccompanied by any pain in the ear, tinnitus, otorrhea, facial paralysis, or visible alteration in the membrane tympanorum, and gradually increased in intensity. When the patient left the hospital, towards the end of last year, after a very protracted convalescence, the deafness upon both sides was then, as it still continues, complete. This case has been more fully entered into on a previous page. In it were found associated the strange phenomena of complete deafness on both sides, and of blindness of one eye—phenomena, as it appears, of sufficiently rare occurrence.

It is difficult to believe that the deafness in all cases is dependent upon inflammatory changes in the ear, as Burdon-Sanderson[a] would suggest.

[a] Parliamentary Reports, 435, 1865.

The absence of pain, of otorrhea, of tinnitus, of facial paralysis, the early appearance, and the, as it were, spontaneous nature of the deafness in many cases, as in the one which we have given, seem opposed to this view. In a few instances, however, Jackson and Warren have observed purulent discharges from the ear; and the autopsies of Klebs and Lissauer[a] undoubtedly demonstrate the inflammatory nature of the affection in the cases they have detailed. Stillé[b] holds with Niemeyer and Ziemssen[c] that this condition appears to depend chiefly upon the pressure of the plastic exudation, in which the auditory nerves are embedded either in the fourth ventricle or after their exit from the brain; while Mannkopff thinks it more probably is due to softening of the nervous substance of the medulla oblongata, which forms the floor of the fourth ventricle. It is not easy to understand why, if such were the case, both portions of the seventh nerve should not usually suffer; yet the co-existence of deafness with lesion of the portio dura and the converse is anything but common. It seems very probable that all or any of these supposed causes may sometimes variously operate, and that the explanation of the deafness is not in all cases to be sought for in the same pathological condition. In the absence of more extended researches we can now only rely upon the results of the *post mortem* examinations of Klebs and Lissauer, from which it would appear that the loss of hearing was the result of inflammation of various portions of the tympanum and labyrinth.

It does not, however, always happen that blindness or deafness are the lesions of the organs of sight or of hearing from which the patient has to suffer. On the contrary, morbid acuteness of hearing, as of vision, is sometimes experienced, so that all impressions of sound, as of light, are painful and intolerable—conditions closely analogous to the cutaneous hyperesthesia.

Indeed, of all the lesions of the special organs of sense, none are more remarkable than the lesions of cutaneous sensibility, and foremost among these the peculiar exaltation of cutaneous sensibility which usually manifests itself shortly after the commencement of the illness. Many even go so far as to say that it is absolutely characteristic of the disease; but such is far from being the case. During the recent epidemic it was rarely absent. Sometimes the whole, sometimes portions only of the body were sore to the touch; and in extreme cases the slightest movement caused exquisite pain. Sometimes even the mere touch, as Hirsch states, seems capable of recalling to consciousness patients in whom this faculty was well nigh extinguished. We cannot agree with Burdon-Sanderson in regarding it as a mere consequence or interlude of the

[a] Mentioned in Burdon-Sanderson's Report.

[b] Epidemic Meningitis, Philadelphia, 1867, p. 46.

[c] Deutsch. Archiv. für Klin. Med. I. 72, 346.

pains which are so remarkable. Exaltation of the muscular is as common as that of cutaneous sensibility; and the distinction can be made on the one hand by making deep pressure, on the other by pinching up a fold of skin. The opposite condition of anesthesia has been rarely noticed, save in connexion with paralysis.

Disorders of the remaining organs of sense are very uncommon. They have, however, been occasionally noticed; for, Corbin[a] has observed, loss of the sense of taste, and Ames[b] loss of that of smell in one nostril, with a purulent discharge from the nose.

The most prominent and most constant of the signs presented by the digestive organs is vomiting. As was previously stated, it is almost invariably observed during the premonitory stage; and in very many cases the onset of the disease dated from its occurrence. Usually the patient is attacked by vomiting, without any previous feeling of nausea; sometimes, however, a frequent and distressing nausea and inclination to vomit is alone complained of. During the first twenty-four hours it occurs with more or less frequency, being often excited merely by the patient's raising himself up. It seldom continues during the entire course of the illness, but recurring at a late period with increased or renewed pain in the head and convulsions, as in the case of Dooley, it furnishes one of the most important signs of hydrocephalus. The matter discharged from the stomach has been very frequently a greenish fluid, containing at first whatever remained in the stomach. American and European writers are equally agreed upon this point. In our experience this was the character of vomiting almost invariably met with, the matters vomited being in many instances expressively described as being "as green as the grass." In other cases the ejecta consisted only of a white viscid fluid resembling mucus, or of the contents of the stomach. The quantity of fluid vomited has sometimes been peculiarly copious; and in these cases regurgitation rather than vomiting has been observed. As regards its import, its occurrence oftentimes without previous nausea being called forth, and increased by the act of rising, its peculiar greenish character, its great frequency, its early occurrence, its association with pain in the head, furious diarrhea, and other cerebro-spinal phenomena, and the absence of epigastric tenderness, all alike denote its sympathetic character and its cerebral origin.[c]

The tongue presents no characteristic appearance. Great differences have been found in the degree of thirst and loss of appetite in individual cases. Sore-throat has been mentioned as a not infrequent symptom in the American epidemics. Redness of the gums and fauces with or

[a] Gazette Medicale de Paris, 1848, p. 435.
[b] Paper on Epidemic Meningitis, Montgomery, 1848.
[c] Vide Graves' Lectures, Neligan's Ed. p. 128.

without swelling was observed. We only found this complained of in one case—that of W. H.—in which the fauces, upon examination, appeared of a deep red colour. Levy also speaks of a thin, pearl-coloured whitish exudation upon the mucous membrane of the gums and fauces. Apthæ have been occasionally observed. Swelling, with or without suppuration, of the parotid, submaxillary, and cervical glands is rare, and generally fatal. Epistaxis[a] has sometimes been so considerable as to place the patient in imminent danger. More or less obstinate constipation has been usually noticed, a circumstance in which this disease resembles other forms of meningitis. The opposite condition has been much less frequent. During the epidemics at Strassbourg and in Sweden, profuse diarrhea was not uncommon, sometimes at the commencement of the illness, but generally at a much later period. During the late epidemic in Dublin, violent purging and vomiting often ushered in the attack;[b] but, like the vomiting, the purging soon ceased, and, during the remainder of the illness, the bowels usually were either natural or confined. Hemorrhage from the bowels has been noticed in a few fatal cases. Jaundice has been so rarely alluded to, that it merely deserves a passing notice. It was particularly remarked by Besseron[c] in the Algerian epidemic in 1847, and is ascribed by him to the eminently bilious diathesis then prevailing. The meteorism which at times distresses the patient is often associated with painfulness of the abdomen to the touch, the abdominal muscles at the same time being usually flattened or spasmodically retracted. Wunderlich and Mannkopff specially allude to the frequency of enlargement of the spleen; but other German writers have not verified this by their experience. In this country, it has very rarely been noticed, and appears to be an accident rather than an essential part of the disease.

The urine was in no respect characteristic or uniform. Sometimes diminished in quantity, at other times profuse, or depositing a copious sediment of lithates, uric acid, or triple phosphate, it was either retained or passed away involuntarily, owing to paralysis of the bladder or of its sphincter. In not a few instances it has been found albuminous, containing blood corpuscles and casts of the uriniferous tubules, which, in some cases, may have been due to the renal irritation caused by cantharides absorbed from the blistered surfaces. The same phenomena have, however, been observed where blisters had not been applied. Pus also occasionally has appeared in the urine. In one of our cases, that of W. H., the deposit was found upon the eighth day to consist wholly of pus, and it is much to be regretted that leave could not be obtained to inspect the abdominal viscera. It is also to be observed

[a] Githens Amer. Jour. of Med. Sciences. July, 1865, p. 93.

[b] Vide cases.

[c] Gaz. Méd. de Paris. 1847, p. 514.

that, in this case, pus, or greenish lymph, was found deposited in the tissues surrounding several of the joints. The occurrence of sugar in the urine was once observed by Klebs[a] and by Mannkopff.

The function of respiration, and the respiratory organs, are frequently deranged from several conditions, and in several modes, in cerebro-spinal meningitis. Though commonly normal, both in its character and its rate, at times the respiration assumes the well-marked cerebral character which has been so faithfully described by Graves,[b] as occurring sometimes in the course of the continued fevers. This cerebral character, which was observable in several of the cases which came under our notice, is the only condition of the respiration which appears to demand particular mention. Among the secondary affections of the respiratory organs which have most frequently attracted attention, are bronchitis, broncho-pneumonia, hypostatic congestion, œdema, and apoplexy of the lungs. Pneumonia and pleuritis have very seldom even been alluded to. Hirsch shrewdly remarks that they sometimes manifested themselves so slowly that they were first demonstrated in the examination of the body after death. At Philadelphia lately, however, pneumonia seems to have been not an uncommon complication.

In connexion with deviations from health of the respiratory, those of the circulatory system may, with greatest advantage, be considered, not alone on account of their close anatomical connexion, but from the mutual dependence of the functions of each upon those of the other. Besides the exceedingly rare occurrence of pericarditis, the variation in the heart's action and in the ratio of the pulse and temperature, demand notice. Sometimes the initiatory chilliness or rigors, by which the disease is generally ushered in, are but faintly marked; while not infrequently chills, sometimes even amounting to rigors, succeeded by heats, are experienced many times by the patient during the course of the illness. So great are the variations which are manifested in various cases and at various periods in the conditions of the pulse and temperature, that any attempt whereby these might be shown to be in any way characteristic of the malady, should such even be possible, seems practically of little importance. After some experience, we believe that so much value should not be laid upon particular curves of temperature, as diagnostic of certain febrile conditions, as some would endeavour to persuade us. Even as we believe that no condition of the pulse, in like manner, we hold that no condition of the temperature is characteristic of any one disease; and such attempts, from the want of success consequent thereon, too freqently lead to the rejection, as worthless, of the thermometer. The same spirit that should lead to the study of the varying conditions of the pulse should lead to the study of the variations of the tem-

[a] Virchow's Archives. Bd. 34, p. 395.

[b] Clin. Lec., Ed. Neligan, p. 116.

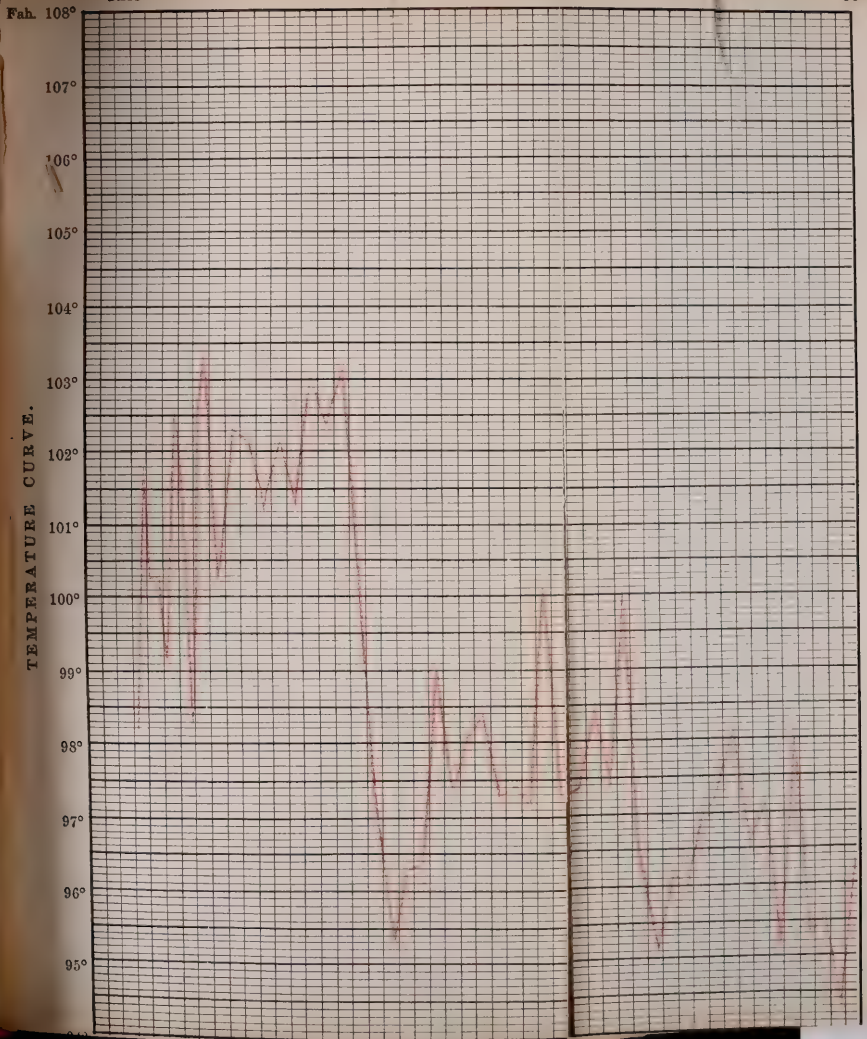
perature, not, indeed, for the purpose of furnishing means of diagnosis, but for their intrinsic and relative value in connexion with other phenomena.

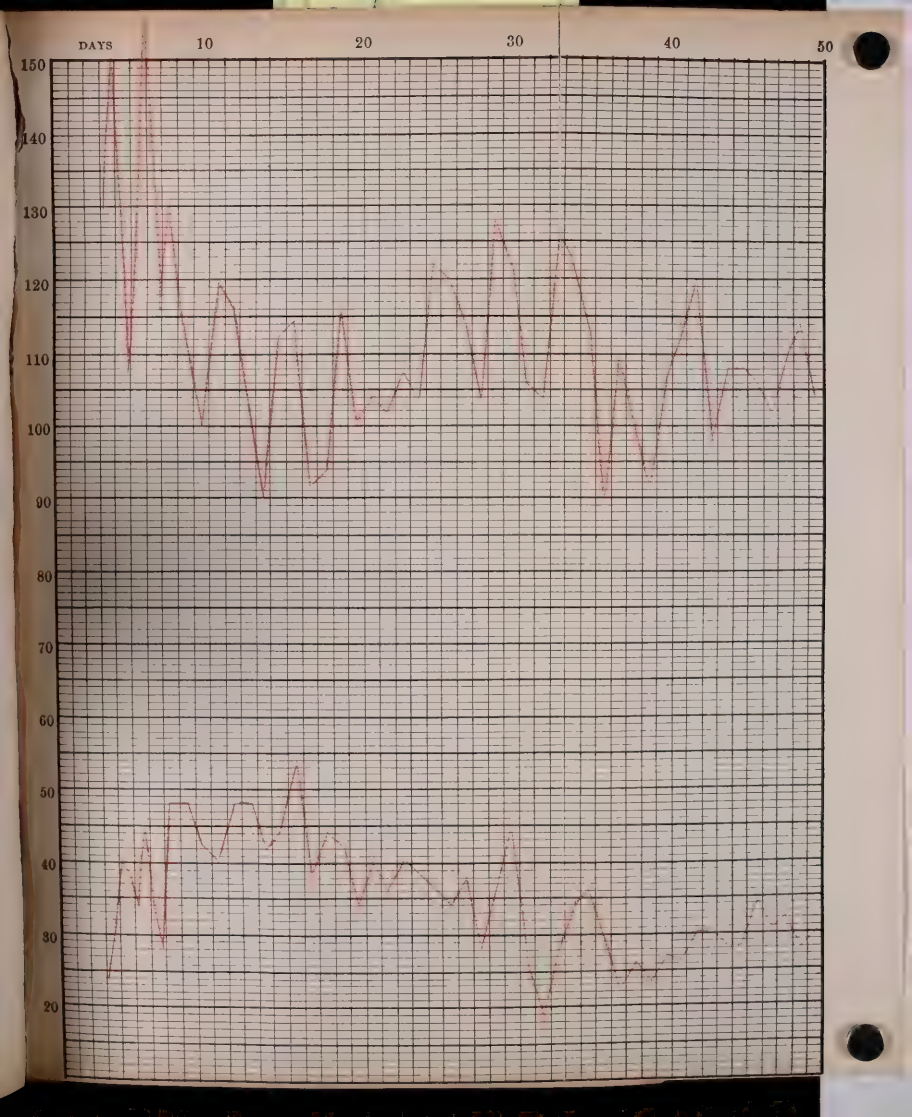
As regards the pulse—its frequency, its force, its volume, its regularity and other qualities, are subject to repeated, and often inexplicable, changes. In frequency we, in almost every case, found it greater than natural, as may be seen by consulting the annexed charts. As in other diseases attended with extreme debility, the least muscular exertion, or change of posture, increases its frequency and alters its rhythm; and the same increase is also noticeable during the paroxysms of pain. This want of regularity, which is remarkable in the behaviour of the pulse, is also witnessed in the varying conditions of the temperature of the body. To Wunderlich and Ziemssen, in Germany, and, subsequently, to Hirsch, Burdon-Sanderson, Niemeyer, Mannkopff, and Githens, we are indebted for the most careful and exact researches, by the aid of the thermometer. All these observers have found the temperature somewhat raised, sometimes even very considerably; and our experience is confirmatory of these facts. In one instance only—a case of *meningite foudroyante*—which was brought to the hospital in a state of extreme collapse, when no pulse could he detected in any of the superficial arteries, did we find the temperature lowered; but, even in this instance, if we accept the history that was given by the patient's attendants, there was at first no inconsiderable elevation of temperature. The extreme irregularity of the thermometrical results has been particularly dwelt on by Hirsch and Ziemssen. Wunderlich and others also notice the extreme incongruity between the pulse-rate and temperature. Immediately preceding death the temperature has often been found very high, but observations of a contrary character also are wanting.

The heart's action and rhythm present no peculiarities, more than might be expected from a disease attended with such prostration. Pericarditis is so rare a complication that, by most writers, it is not mentioned. One case has been recorded by Tourdes, and another by Wunderlich, in which the affection was not diagnosed during life, and was only discovered during the autopsy. The following was an example of this accident of the disease which came under our notice; and, as far as we are aware, there has been observed but one other instance of it during the late epidemic.

Mary Francis, aged five years. On the evening of the fourth day from the commencement of her illness, the day upon which she was admitted into Sir Patrick Dun's Hospital, she was found complaining of great pain, which she referred to her forehead. Her cheeks were flushed her eyes bright and glassy with the pupils contracted, and she had much intolerance of light. Her tongue, which she readily protruded and promptly withdrew, was covered with a greyish-white pasty fur. She

MARY FRANCES.




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suffered much from thirst, and continually called for water, which she swallowed greedily and with evident relish. Along with great restlessness, there seemed to be a morbid quickness of apprehension, watchfulness, and slight cutaneous hyperesthesia. The deep cervical muscles posteriorly were rigid, and the head was persistently retracted. The muscles of the extremities were relaxed. Some small spots, dark in colour, which did not disappear upon pressure, were observed on the legs, arms, and front of the chest. These, in some places, were raised, and, in other places, on a level with the surrounding skin. The respiration was very irregular, at one time fast, at another slow; it was panting, and interrupted by frequent sighing, having at times a catching spasmodic character. The pulse at the wrist was very hurried, small, and weak, though regular and equal; while the carotids throbbed, and the heart's impulse was strong and jerking. A loud and continuous bellows-murmur, accompanying, as well as could be ascertained, the first sound of the heart, was audible all over the precordial region; its point of maximum intensity was situated at the apex of the heart, and decreased gradually as it was traced upwards along the sternum. It could, however, be clearly heard at the left sterno-clavicular articulation. Upon the sixth day, slight *frottement* was heard at the base of the heart; and the suspicion of pericarditis, which in the course of a few days remained no longer doubtful, was seriously entertained. At no time during the course of this complication were there evidences of much accumulation of fluid within the pericardium; and the effusion throughout was believed to be chiefly, if not wholly, of a fibrinous nature. These signs disappeared in the course of a fortnight, leaving, it was supposed, the pericardium adherent. A double bellows-murmur, however, remained behind, and, many months after her dismissal from hospital, could be traced from the heart all along the aorta to its bifurcation. The question, which in this as in so many similar cases arises, as to the functional or organic nature of such a murmur, remains as yet unsolved. Some days subsequent to the discovery of the pericardial affection, slight facial paralysis on the left side was noticed, which subsided in the course of a few days, and did not afterwards reappear. The spots, too, about this time faded. The rigidity of the cervical muscles, however, continued for a period much more prolonged, and she became much emaciated. In fine, her convalescence was exceedingly protracted; nor did she quit the hospital till the end of the third month from the date of her admission.

Last, but not least among the physical signs, is the condition of the skin; paleness of the face, as also the peculiar flush upon the cheek, the bluish appearance of the extremities during collapse, and the varying state of dryness or moisture of the skin, merely deserve a passing notice. It is chiefly owing to the numerous forms of cutaneous eruptions, which have manifested themselves in many epidemics with such frequency as

even to have given their names to the disease itself, that the condition of the skin is deserving of special attention.

Among these eruptions, by far the most constant is that of herpes. In many European epidemics it has been particularly frequent, in 1840, even suggesting to De Renzi the idea of employing it to designate the disease. The lips and alæ nasi are the chief seat of this vesicular eruption; but it is frequently found upon the ears, eyelids, and cheeks. In rarer instances it has been even seen upon those portions of the scalp covered with hair, the neck, trunk, and extremities. Hirsch shows that it frequently diffuses itself over a large extent of surface, spreading from the lips upwards towards the eyelids and the forehead, or, as in another case, from the throat to the upper part of the arm. It usually appears within the first week, but sometimes not till a much later period. Some authors have regarded its occurrence as of good augury; but neither this nor a contrary opinion would seem to be warranted by facts.

Next to herpes, and not infrequently commingled with it, a peculiar petechial eruption, often of a singularly appalling character, has arrested the attention of all who have witnessed it. Like herpes, observed only in individual cases during the course of many epidemics of cerebro-spinal meningitis; in others, it is of such frequent occurrence that it has formed a no less characteristic sign of the malady than the vesicular eruption previously described, and has led, as well in the Old World as in the New, to many unhappy varieties of nomenclature. This petechial, purple, or dark-coloured eruption, which, during several epidemics in Europe and America, has manifested itself upon the surface of the body, and of the internal viscera, with more or less intensity, is so frequently wanting that it must be regarded as by no means a necessary phenomenon of the disease. Hence it is that all such names, and they are many,[a] as have from time to time been given to the disease, owing to the acccident of this eruption are unsuitable, as they only allude to a sign of the malady, which is anything but constant. Again the petechial eruption has been so frequently found associated with those phenomena which, as well during life as after death, characterize cerebro-spinal meningitis, that it cannot but be considered as merely an accident of this disease, dependent upon causes at present unknown. We cannot, therefore, regard it as diagnostic of a peculiar blood disease, distinct and wholly unconnected with cerebro-spinal meningitis. Among the cases, appended to this report, are to be found many in which the characters of this eruption are abundantly exemplified. We have observed these spots to become purulent and scab over in several cases, leaving, as in the case of Mary Hastings, permanent marks or pits

[a] "Spotted fever," "petechial fever," "morbo petechiale," "febris nigra," "black death," "malignant purpuric fever," "malignant purpura," "pestilential purpura," "purpuric fever," "neuro-purpuric fever," "typhus petechialis malignus novus," &c.

like small-pox. In some rare instances, observed by Stokes and Banks, the spots ran together and coalesced over some portions of the body, so as to cover a large extent of the skin, and render it as completely black as though it was wrapped in some dark shroud. In the instances to which we have made allusion, the entire right arm and half of the right side of the chest in the one case, and, in the other, the whole of the lower portion of one leg and foot, were thus affected. The late epidemic was as remarkable for the great frequency, as the previous epidemic of 1846, for the absence of petechial eruptions; and yet, there can be little doubt that both these epidemics were manifestations of the same disease. The sudden development and great extent of this eruption, with the profound collapse thereon attendant, as Gordon[a] has pointed out, are very appalling. Many, indeed the great proportion of such cases, ran a rapidly fatal course—a circumstance observed in other epidemics in which the petechial eruption appeared. Some few, however, like Mary Hastings, escaped after passing through extraordinary vicissitudes from which recovery was apparently hopeless, and lived to tell the tale of their sufferings.

A question has been lately propounded—are these cutaneous eruptions, herpetic and petechial, merely the results of the lesions of the nerve centres? Strange phenomena, no doubt have followed injuries of nerve-trunks, as exemplified in the records of Morehouse[b] and others, during the late American war, and in the writings of Hutchinson, Von Barensprung,[c] and others. Among these is specially to be noticed, the eruption of herpetic vesicles. Herpetic vesicles are the distinguishing character of the neuralgic affection known hence by the name of herpes zoster. Herpes labialis was also observed in a case of inflammation of the membranes of the brain and spinal cord, dependent on caries of the petrous portion of the temporal bone, recorded by Mannkopff.[d] Of the connexion, therefore, between herpetic eruptions and nervous lesions there seems to be little doubt. But, in the present state of our knowledge, it seems to be premature to regard the herpetic eruptions as altogether dependent upon the lesions of the nervous centres. The connexion between the petechial eruptions and the nervous lesions is anything but proved; and it remains yet to be determined whether that condition of the blood, whereby its transudation through the walls of the capillaries is favoured, is, in itself, a primary or a secondary manifestation in this disease.

[a] *Vide* Dub. Quart. Jour., May, 1867. The entire of Dr. Gordon's description of this eruption is particularly valuable.

[b] Report on Gunshot Injuries to Nerves, observed in the late American War, by Mitchell, Morehouse, and Keen. Philadelphia, 1864.

[c] Annalen der Charite Krankenhauses zür Berlin, ix. 2, p. 40.

[d] Uber Meningitis Cerebro-Spinalis Epidemica. Braunschweig, 1866. P. 213.

Besides these two great forms of eruption—the herpetic and the petechial—many others less frequently have been observed, either separately, or in conjunction with either of those which have been mentioned. Suffice it to notice the occurrence of carbuncles, pustules, and buboes, urticaria, sudamina, bullæ of various sizes, roseolous, rubeolous, scarlatinous, erythematous, erysipelatous, and ecthymatous eruptions. But, many and various as are these eruptions, it is to be remarked that, in a large number of cases of cerebro-spinal meningitis, none of them—even the herpetic—are present, and that therefore their presence cannot be considered necessary to the full development of the disease.

The condition of the joints is worthy of notice. Sometimes they become swollen, red, and tender; at other times red and painful, without any swelling; while, again, intense pain and rapid enlargement from effusion have occurred, unattended with any external redness. We have observed all these varieties in different cases. The joints which we have seen attacked were the knee, elbow, wrist, and the smaller articulations of the fingers and toes. In the case of W. H., the elbows, ankles, and some of the joints of the fingers and toes, were red and tender. In another case, that of Mary Hastings, the knee-joint, after a violent paroxysm of pain, became the seat of rapid and copious effusion, without redness or tenderness on pressure. In a third case, attended with a copious petechial eruption upon the chest and extremities, sudden effusion into the left knee-joint also took place, which did not wholly subside for more than a month. Similar testimony is borne by Gordon and other writers, both during the European and American epidemics. Hirsch, indeed, imagined that this condition had not been noticed before the date of his memoir in 1866; but even as long ago as 1810, it is alluded to by Welsh, Jackson, and Warren, in their report upon the spotted or petechial fever, then prevailing in the United States. In a case recorded by Rinecker and by Wunderlich, the affection of the joints preceded the meningitic symptoms by more than a day; and Mannkopff[a] states that some French physicians speak of an alternation of epidemic meningitis with an acute rheumatic affection of the joints.

The great and sudden debility which marks the onset of the disease is no less remarkable during its entire course. The strength of the patient, from the moment of the attack, seems completely prostrated; and, should death not soon follow, daily becoming weaker and weaker, he gradually wastes away till he reaches an extreme degree of emaciation. In this state he frequently succumbs; but, even if he should be spared so fatal an issue, he continues in a pitiable state of marasmus and debility, and his convalescence is often irregular, and extremely protracted, sometimes extending over months. Hirsch also calls attention to the fact, that numerous phenomena of a nervous character, such as long-

[a] Page 157.

continued headache, neuralgia, periodical attacks of convulsions, delirium, tetanic stiffness of the neck in moving it, morbid sensibility of some portions of the skin especially of the back, palpitations of the heart, &c., embarrass the return to health. Relapses, moreover, are not uncommon, and are often fatal.

Running a rapid course in a few hours on the one hand, on the other, extending over a period the most prolonged, and, between these extremes, exhibiting every possible degree of irregularity of duration, any limitation of the length of the malady seems hardly possible. In not a few instances during the recent epidemic in Dublin, as also during the previous epidemics in America, and on the Continent, the extreme rapidity of the disease has been most appalling. Such was the remarkable case detailed by Gordon, in which the entire duration of the disease was under five hours—possibly the shortest upon record. Another such case, given by Levy,[a] will bear comparison in the same respect, even with that of Gordon. The patient was suddenly attacked and was brought into hospital in a state of profound collapse. He died in an hour after his admission. Greenish lymph was found along the vessels on the upper surface and base of the brain, and in places along the cord.

As regards the number of those who suffered from the disease, and the proportion they bore to the sum total of the population, it is impossible to arrive at any definite results, owing to the very defective and evidently unreliable information which exists thereon. The same may be said of the rate of mortality in the various epidemics. Here, also, the statistics are not of such a kind as to enable us to form any certain conclusions. Probably Hirsch's view, that one-third of those attacked succumb, is, on the whole, the most correct opinion that can be formed in the present unsatisfactory state of our statistics.

Among the sequelæ which frequently attend the unfortunate sufferers even after recovery, for years, or even attend them during the remainder of their days, as incurable mementos of the malady, are deafness, complete and incurable in too many cases—as is to be feared in that of Mary Hastings—and, in little children, leading to deaf-dumbness; impairments of vision, owing to opacities of the cornea, closure of the pupil or posterior synechia, opacities of the lens, or of its capsule, opacities or softening of the vitreous body, detachment opacities or atrophy of the retina, degeneration of the choroid and posterior staphyloma, degeneration of the optic papilla, or even atrophy of the globe; paralysis of one or more limbs, or a general impairment of muscular power, seldom long persistent; chronic hydrocephalus; impairment of intelligence, rarely of weakness or loss of memory, complete imbecility, or even mania; and persistent pains in the head.

[a] Gazette Médicale de Paris. 1849, p. 830.

As regards prognosis, it may be stated generally that the greater the rapidity of development, and the greater the intensity of the symptoms and physical signs, the nearer the time of life of the patient to the extremes of infancy or old age, the earlier the stage of the malady, and the more profound the symptoms and signs of depression or of collapse, the more unfavourable is the augury. We cannot, however, too strongly bear our testimony to the excellence of Stillé's advice, that "it will be found imprudent too confidently to predict the issue of any grave case of the disease. Patients have recovered when all hope seemed forbidden, and others have died on the sudden accession of nervous symptoms, cerebral or spinal, when the hour of danger seemed to have passed away."

Of a disease comprehending so varied an assemblage of symptoms and physical signs, the morbid lesions revealed after death are sufficiently characteristic.

The body is frequently found emaciated in a degree proportionate to the duration of the illness—sometimes to a very notable degree—as happens in other diseases characterized by great exhaustion and marasmus. This extreme emaciation would appear, from the researches of Klebs, to be due to atrophy of the muscular fibres, as well as of the interstitial connective tissue. He has also detected with the microscope, a granular deposit between the muscular fibres. Cadaveric rigidity is generally well-marked and long-continued. In Burdon-Sanderson's cases there was no rigidity of any of the muscles which had been contracted during life; but this is not always so, as in the case of Dooley, the muscles of the neck, which were affected during life, were rigidly contracted after death; purple discoloration and hypostatic congestion of the dependent parts takes place rapidly after death; while in some rare cases, the whole body, even before death, has become rapidly black, and a sickly odour, as of incipient putrefaction, has been evolved. While the dependent portions of the body become discoloured, the anterior become pale, and the petechiæ, if any have existed during life, frequently are changed to a lighter or a redder hue. On the contrary, however, in other rare cases, so rapid is the process of dissolution, that soon after death large patches of ecchymosis become diffused over the surface of the body, blood pours from the mouth, and the body swells to such an extent as to be recognized with difficulty. Ecchymoses have also been observed on the internal viscera, as in the case of W. H. Indeed, the rapidity with which putrefaction usually ensues is remarkable.

On removing the calvarium, almost all writers, save Mayne, have found very marked indications of hyperemia in the diplöe and dura mater. The vessels bleed very freely, and the internal surface of the membrane is often highly polished and intensely injected. The sinuses

are seen to be turgid, filled with dark coagula, and sometimes even with firm fibrinous masses; and unusually large Pacchionian bodies, sometimes softened and purulent, have been met with projecting through the dura mater, near the superior longitudinal sinus. Many[a] have noticed the dry, opaque, lustreless, and clammy state of the arachnoid membrane; while, on the contrary, others[b] of no less eminence have found this membrane often perfectly normal. A like difference is observable in the condition of the cavity of the arachnoid sac: during one[c] epidemic ordinarily containing a small amount of serum and only occasionally dry, or marked by flakes of lymph, during another[d] this cavity is stated to have contained no lymph or other inflammatory products. During the recent epidemic in Dublin the same differences, in the absence or presence of fluid or of opacities within or upon the arachnoid membrance, were noticed. A fine arborescent injection of the cerebral arachnoid is spoken of by Burdon-Sanderson. But, though these lesions of the arachnoid and dura mater are not uncommon, the changes which are found underlying the serous tunic in the meshes of the pia mater are much more constant and characteristic. In this respect the observations of all who have studied the *post mortem* appearances since the commencement of the present century are sufficiently uniform. Pus, or lymph, of varying degrees of consistence, colour, and quantity, has been found beneath the arachnoid, disposed as streaks along the vessels occupying the inter-gyral subarachnoid spaces, or more abundantly forming patches of various extent, superficial or penetrating, between the convolutions, on the surface of the brain and cerebellum. The exudation sometimes existed equally on the upper and under surfaces of the encephalon; but its chief seats were the base of the brain, the anterior, middle, and superior subarachnoid spaces, and the superior surface of the cerebellum. The vessels of the pia mater itself are almost invariably found intensely injected, so as to give to the membrane a bright rose tint. Patches of capillary congestion and extravasations of blood are also usually met with scattered over the surfaces of the hemispheres and cerebellum. In some cases[e] the pia mater could be readily stripped off from the surface of the brain without the removal of any fragments of the grey matter, whereas in others[f] the very opposite occurred. The ventricles also are often the seat of effusions of varying quantity and quality—serous, purulent, sero-purulent, or sanguineous.[g] Klebs gives a remarkable case

[a] Mayne, Liddell, Hutchinson, Clarke, &c.
[b] Tourdes, Forget, Chauffard, Lindström, Wunderlich, &c.
[c] Tourdes, Danielson and Mann, De Renzi, &c.
[d] Mayne, Burdon-Sanderson, &c.
[e] Burdon-Sanderson.
[f] Hirsch.
[g] E. D. Mapother, Brit. Med. Jour., May 30, 1868, p. 533.

in which the lateral and fourth ventricles, and their channel of intercommunication, were fully distended with thick yellow pus.

Respecting the lesions of the membranes which invest the spinal marrow, evidence cannot be adduced dating so far back as that concerning the membranes of the brain, owing to their not having been habitually examined. The appearances observed within the spinal canal are, however, altogether similar to those already described as occurring within the cavity of the cranium. The theca vertebralis exhibits marked hyperemia. On dividing it the vessels of the visceral arachnoid are found swollen with blood, and the whole membrane minutely injected. As in the case of the cerebral, so in that of the spinal serous tunic, its sac may,[a] or may not,[b] be the seat of a serous, fibrinous, or purulent effusion. An exudation in all respects similar to that met with in the meshes of the cranial pia mater, and equally varying in quantity, quality, and in extent, is found in the subarachnoid spaces, often completely enveloping the cord. Unequally diffused in general, and collected in larger quantities in some places than in others, it is usually particularly abundant upon the posterior aspect of the spinal marrow, possibly, as Klebs suggests, owing to the influence of gravity. In a case recorded by Hirsch, the central canal of the cord was distended with pus.

Microscopical examination of the exudation, in the cases which are appended, showed that it consisted of granular *debris*, imbedded in which were numerous small granular cells, chiefly circular in form, measuring about $\frac{1}{4000}$ of an inch in diameter, very similar in character to pus corpuscles, save that they were much smaller in size. Burdon-Sanderson's observations are to the same effect. Klebs also justly remarks that very often pus exists where it is not visible to the naked eye, and where, in order to recognize it, even with the aid of the microscope, the observer should be familiar with its transition forms.

Mayne long ago drew attention to the fact that the nervous matter seldom suffered, and when involved was only so accidentally owing to the propagation of the disease from its membranous investments. We can fully bear out this testimony in the cases we have observed both as regards the brain and spinal marrow. The cords we have examined with care, but in only one of them could we find any evidence of disintegration under the microscrope. Specimens, however, have been submitted to the Pathological Society of Dublin by Drs. B. M'Dowel and Hayden, in which the marks of localized softenings of the spinal cord were present. Other writers[c] also record cases in which portions of the spinal marrow were found in a state of complete disintegration. It

[a] Klebs, Stillé, Clarke, &c.

[b] Mayne, Burdon-Sanderson, &c.

[c] Ames, Chauffard, in Revue Med., 1842, Mai, p. 190.

must be admitted, however, that such cases are rare. Softening of the substance of the encephalon, though also uncommon, appears to be more frequent than the corresponding condition of the cord. Allusion is here only made to cases of white softening; but Klebs, on two or three occasions, in rapid cases of cerebro-spinal meningitis, has found foci of softenings varying in shade from straw-colour to red in the centrum ovale, and in each of these cases he has found indications of recent endocarditis.

A question here presents itself as to the relation between the cerebro-spinal lesions and the duration of the attack before death. Chauffard has entered on this inquiry with considerable minuteness; but his statements are much too exact to be generally applicable. The frequency of softening of the nervous matter in his cases, too, is remarkable, and seems to bear little comparison with the experience of other observers. In the exceedingly rapid cases of *meningite foudroyante* we would merely remark that, though very frequently the only appreciable changes to be found are congestions of the cerebral and spinal pia mater, and though the influence of the duration of the disease in determining differences in the appearance and in the amount of the exudation cannot be doubted, in other cases, as will be presently noticed, the exudation, either as regards its quantity or its quality, seemed to bear a proportion not to the duration of the disease, but to the violence of the inflammatory processes.

Much needless stress, in our judgment, has been laid by some writers upon the hyperinotic condition of the blood during life in this disease. After death, in many cases, the blood has been found dark, and either liquid or containing only soft clots. Fibrinous coagula frequently occupied the heart and great vessels. A shrivelled or crenated appearance of the blood-discs, and an irregular distribution of these bodies in the field of the microscope has also been observed.

As regards the condition of the other organs of the body after death, a brief notice will be sufficient. They present a variety of lesions dependent upon the patient's previous health, local causes, and upon the complications which may arise in the course of the disease, but none which essentially belong to its pathological anatomy.

The lungs are generally hyperemic and hypostatically congested; the bronchial membrane reddened and sometimes covered with a viscid secretion. Evidences of pneumonia, too, are sometimes to be found, as well as of œdema and pulmonary apoplexy. Tourdes, Corbin, Lindström, Merkel, Bohmer, and Ziemssen, have, in rare instances, found the pleural cavities containing a fibrinous, serous, or even purulent exudation. The pericardium is sometimes seen studded with small ecchymoses, and in its cavity, as in that of the pleura, inflammatory effusions, the result of a pericarditis sometimes not even until then

suspected, have been discovered. The heart usually appears normal. In its muscular tissue the same changes have been recognized by Klebs as in the other muscles to which allusion has been previously made. The same observer and others[a] have also occasionally noticed marks of recent endocarditis. The gastro-intestinal mucous membrane has sometimes been found reddened or slightly ecchymosed. Tumefaction, with or without ulceration of the solitary and agminate glands, has been met with, but never the peculiar infiltration and ulceration of typhoid fever. Concerning the other abdominal viscera little need be said. The liver, the kidneys, and particularly the spleen, have exhibited varying degrees of congestion and the results of previous disease in individual cases. In the joints which had been affected during life, or in the neighbouring areolar tissue, we, as well as many others,[b] have seen lymph, pus, or other inflammatory products. The lesions of the organs of sight and hearing have been already sufficiently described.

From these brief details it must be evident that the examination of the body after death has generally, wherever it has been made, afforded very constant and characteristic lesions—namely, those indicative of extensive inflammation of the cerebro-spinal meninges. Of these membranes the pia mater and the arachnoid, especially the former, are the chief seat of the local changes; for, well nigh all observers agree that the peculiar characteristic of the disease consists in an inflammatory condition of the pia mater, the vascular tunic covering alike the brain and spinal marrow. Congestions; plastic, purulent, sero-purulent, or serous exudations; sometimes even alterations of the nervous substance itself, of ever-varying extent, singly or together, bear their testimony to the nature of these inflammatory processes. But these inflammatory changes, constant though they be, are not the only, nor are they always the most important features of the disease. Behind them all, as in other affections, modifying and at times predominating, lies another, a constitutional, element, which gives to the disease so many of its varied and most appalling characters. This constitutional element, the importance of which cannot be over-estimated, is remarkably exemplified in those malignant and rapidly-fatal cases of *meningite foudroyante* so called, which occurred within the past two years throughout this island. The lesions here found, in many instances, have been only varying degrees of congestion of the pia mater, and similar experience is not wanting from the records of other epidemics, so that some French writers have even given to this form of the malady the title of *forme congestionelle*. On the other hand, however, it must not be forgotten that, even within so short a space of time as five hours from the occurrence of the first symptoms which ushered in the fatal attack, the products of inflammation have been found

[a] Vide the case of Mary Francis.

[b] Levy, Wunderlich, Klebs, Corbin, Hirsch, &c.

by Gordon beneath the arachnoid membrane, and that, too, without any of the special symptoms of cerebro-spinal meningitis during the brief period of the illness save intense pain in the head and vomiting. Levy's case, which has been already alluded to, is no less remarkable as regards the shortness of its duration and the extensive exudation which existed upon the brain and spinal cord. In one of the cases appended similar changes were noticed thirty hours after seizure. From these and other equally decisive cases, characterized, too, by petechial eruptions, which might be adduced in corroboration, it can be proved that, early as death sometimes occurs, it is not too early for the manifestation of undoubted evidences of inflammation of the membranes of the brain and spinal marrow. From this it follows that a more or less prolonged period of duration is not always necessary for the development of the characteristic signs, *post mortem*, of cerebro-spinal meningitis; and it would appear that, when the products of inflammation are to be found developed within so short a period of time as has been recorded, the inflammation itself, from which they spring, cannot be considered otherwise than primary and as constituting, along with the constitutional element, the pathological essence of the disease.

The diagnosis of cerebro-spinal meningitis is usually attended with little difficulty, especially if at the same time the disease be epidemic. Not a few cases, however, on the other hand, occasionally present themselves, in which the recognition of the malady offers one of the most difficult problems to the physician. Yet such cases, it is almost universally admitted, are rare, and constitute a very small proportion of the whole. In by far the larger number, the onset, course, and termination of the disease are so characteristic that they leave little to be desired to recognize its distinctive features. The phenomena of the malady have been entered into at such length already that a brief recapitulation of only the most important, for the purpose of differential diagnosis, seems here to be required. Suffice it to notice the peculiar vomiting; the violent pains in the head, neck, spine, and limbs; the stiffness and contraction of the neck and back; the trismus; the tetanic expression of countenance; the cutaneous hyperesthesia; delirium, alternating with coma or with lucid intervals, and subsequently merging into profound insensibility; tonic and less frequently clonic spasms; paralyses of various forms and degrees, especially those dependent on lesions of the second, third, sixth, and seventh nerves; the affections of the special senses, particularly those of sight, hearing, and common sensibility; the shifting character of the pulse, temperature, and markedly of the respiration; the variety and form of the eruptions; the singular and often extreme prostration, bearing no portion to the duration or even to the intensity of the sufferings; and, in too many instances, the appalling rapidity of the fatal issue.

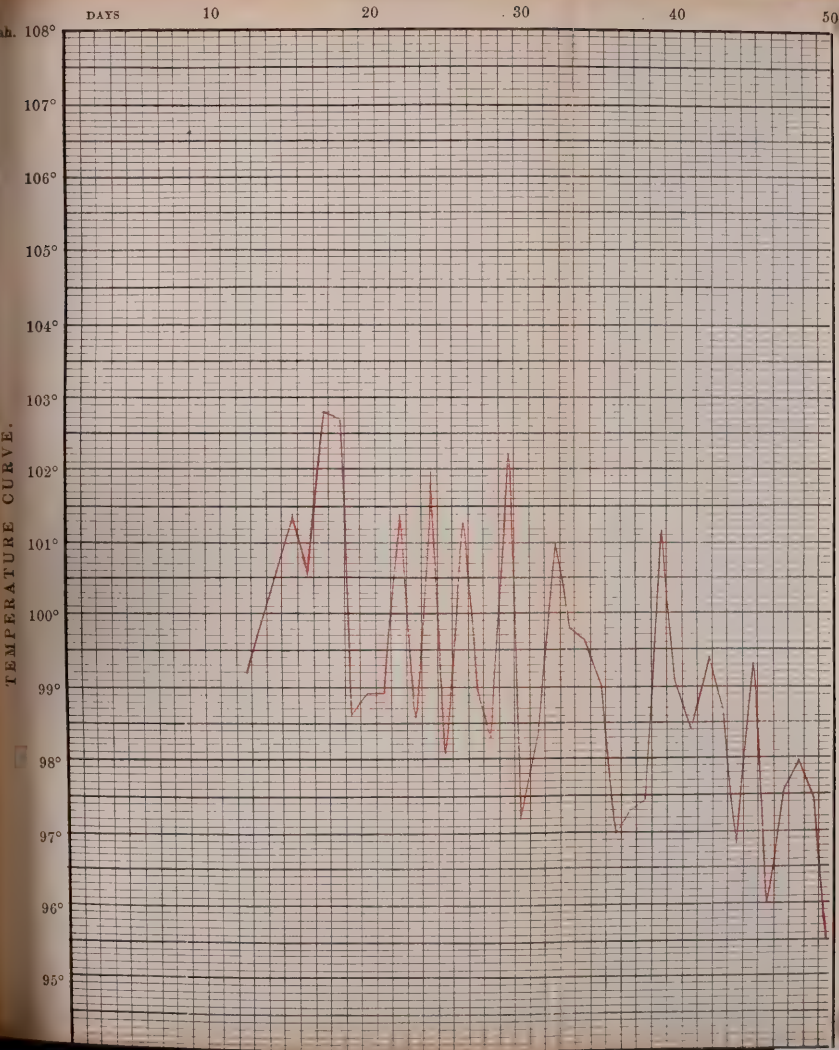
After the lapse of many years it cannot be affirmed that the darkness in which the etiology has been shrouded is in anywise dispelled. The influence of the season of the year, weather, climate, locality, hygienic condition, sex, age, occupation, fatigue, debility, grief, excesses, overcrowding, insufficient ventilation and sewerage, diet,[a] and even intestinal worms, have each and all at different periods been appealed to as capable of explaining the occurrence of the disease. A detailed inquiry into each of these alleged causes would needlessly prolong this report. We must content ourselves, therefore, with stating that they all alike offer to us no satisfactory solution of this most difficult question.

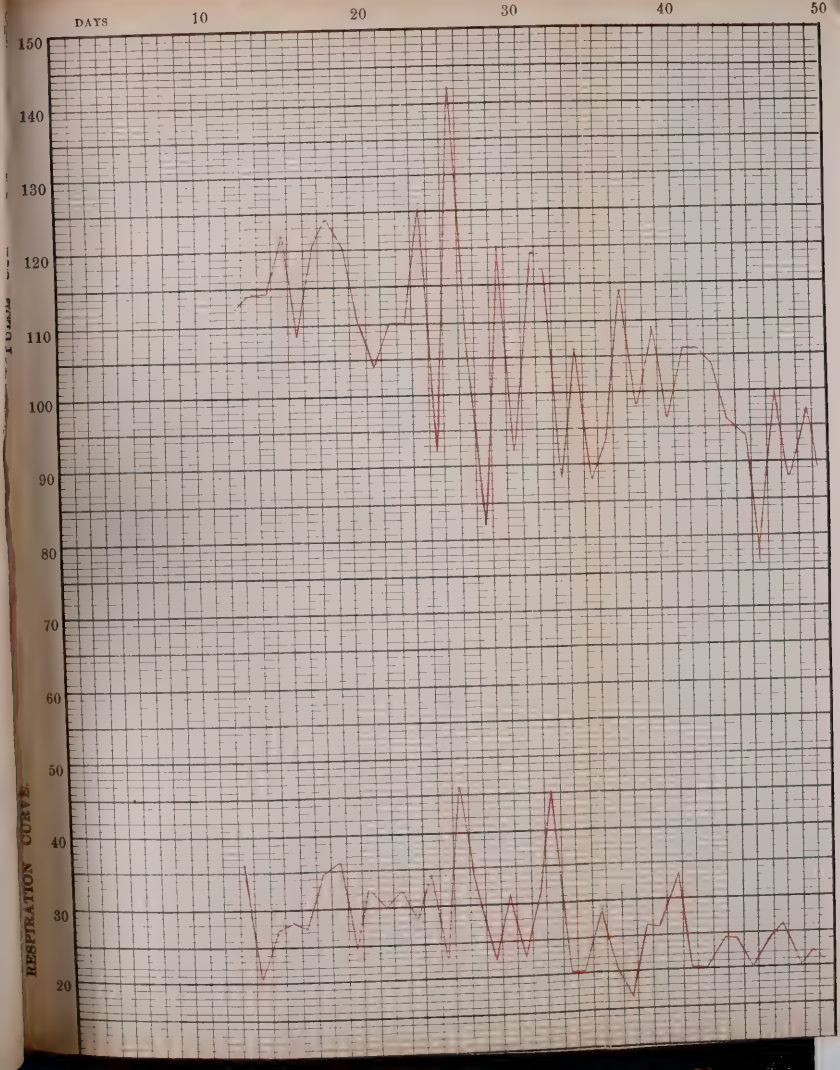
The consideration of the communicability or non-communicability of this, as of some other diseases, is perhaps one of the most difficult problems in pathology. And the fact of the unsettled state of this question, even at the present day, as regards cholera, is not calculated to encourage us to adopt positively any one opinion. Facts have been advanced by Hirsch, Stokes, and particularly by Boudin, which, taken alone, would go far towards determining the communicability of the disease. On the other side, however, we are met by the almost universal experience of the profession that no such communicability could be ascertained to have occurred, even under those conditions most favourable for its development. This problem thus remains unsettled. We may merely remark that we have not seen any case in which there was reason to believe that the disease was acquired by communication or was communicated to others.

As regards the relation of expizootics and epidemics of cerebro-spinal meningitis, we have the authority of Mr. H. Ferguson, the well-known Veterinary Officer to the Privy Council in Ireland, for stating that, on each occasion when an epidemic of cerebro-spinal meningitis has appeared in this country, it has been preceded by, and co-existed with, an epizootic of the same nature among the lower animals, especially pigs and dogs. In the disease called purples among the former—so called by reason of the cutaneous eruption which, though at first red, soon becomes purple—there have been found, on *post mortem* examination, evidences of cerebro-spinal meningitis, besides extravasations of blood into and upon the muscles and viscera, and within the cerebro-spinal cavity. In the pig this malady is almost always accompanied by the characteristic purple eruption. Other varieties of it have been popularly termed "black leg," "joint fever," &c.; and the same disease, unattended by the cutaneous eruption, has been observed in horses, oxen, &c. Splenic apoplexy of oxen and sheep, which in France has been connected with

[a] It is a curious circumstance, in connexion with the question of diet, that ergot has been lately used in America (Boston Med. and Surg. Journ., July 18, 1867,) as a remedial agent in this disease, of which it was, without proper foundation, suggested by Dr. B. W. Richardson (Social Science Review, May, 1865, p. 403,) to be a cause.

JOHN DOOLEY.


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the entrance into the blood from the air of the bacteria, presents somewhat similar phenomena. Healthy animals inoculated with blood taken from animals labouring under splenic apoplexy become similarly affected, and it has been stated by E. Crisp[a] before the Epidemiological Society of London, at their meeting in July, 1867, that if the flesh of animals thus affected be given to pigs they become the subjects of cerebro-spinal meningitis.

The preceding and following illustrative cases which we observed as resident in Sir P. Dun's and at the Meath Hospitals, are inserted by the kind permission of the Physicians of those hospitals :—

John Dooley, aged 10. On the day upon which he fell sick he was found by his aunt in the afternoon vomiting and complaining of pain in his head. Shortly before midnight he again vomited, the ejecta, on each occasion, being, according to the statement of his mother, "as green as the grass." The vomiting continued during the next day, so that nothing that he partook of remained upon his stomach. In the course of the morning, at 9 a.m., furious delirium set in. He commenced roaring so loud that his cries could be distinctly heard in the street. He complained of severe pains in his head, in the back of his neck, along his spine, in his right knee, and in his belly, and of general soreness when touched. In the afternoon, at 3 p.m., purple spots made their appearance upon the upper and lower extremities. They were of various irregular shapes—some very large, some very small, some raised above the skin, others again upon a level with it. In the course of four days, having filled up with purulent matter, they scabbed over and faded away. The screaming and other symptoms continued with very slight periods of intermission during the succeeding week; and he kept continually grinding his teeth. His consciousness, however, remained unimpaired. On the twelfth day from the commencement of his illness he was admitted into Sir P. Dun's Hospital. When visited he lay upon his left side with his head far retracted, his face flushed and bearing a semitetanic expression; and nothing would induce him to alter his position, as the slightest movement caused him exquisite pain. His tongue, which at first had been covered with a bright green coating, was now covered with a thick pasty yellowish-white fur; it was red and moist at the edges. He complained of pain in the back of his head and neck, but there was no tenderness upon pressure. His lips and gums bore traces of the continued grinding of his teeth.

The daily records of the case from this time present nothing particularly worthy of notice, save the fact that the disease assumed a very irregular remittent type, very well-marked periods of exacerbation and

[a] Vide Lancet, July, 1867.

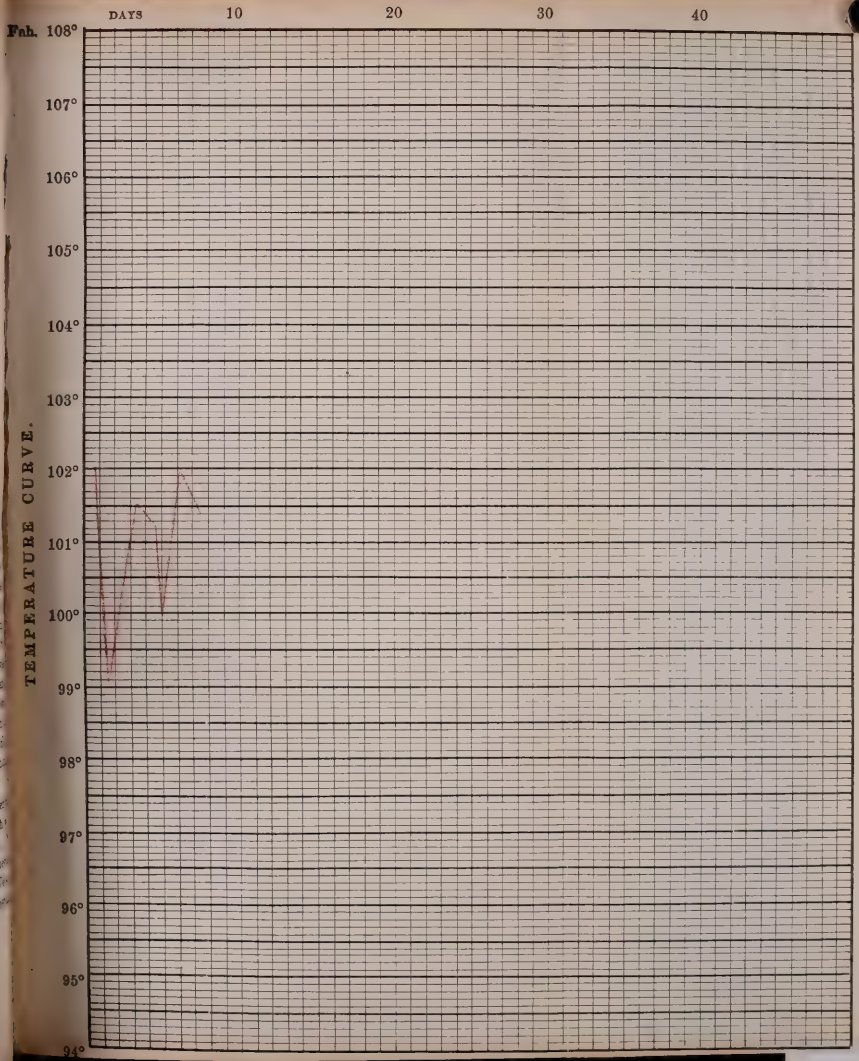
remission of the symptoms and physical signs, succeeding each other at longer or shorter intervals. During the periods of remission the patient was cheerful, free from pain, and moved about freely in bed. On the other hand, during every exacerbation he was peevish and fretful, easily annoyed, and racked with pains in his head and neck. His face, too, at these times was generally flushed and wore a curious tetanic aspect. The retraction of his head subsided about a week after his admission, and was succeeded by rigidity of the neck. The cutaneous hyperesthesia was very remarkable, reaching not unfrequently such a height that if touched he immediately cried out and begged his tormentor to desist. Attacks of vomiting very often ushered in or attended the periods of exascerbation so that there were times when nutrient enemata were the only means left of supplying him with nourishment. Thus, reduced to little better than a skeleton, he lingered on till the sixty-sixth day of his illness, when he was seized with vomiting and convulsions, and shortly after died.

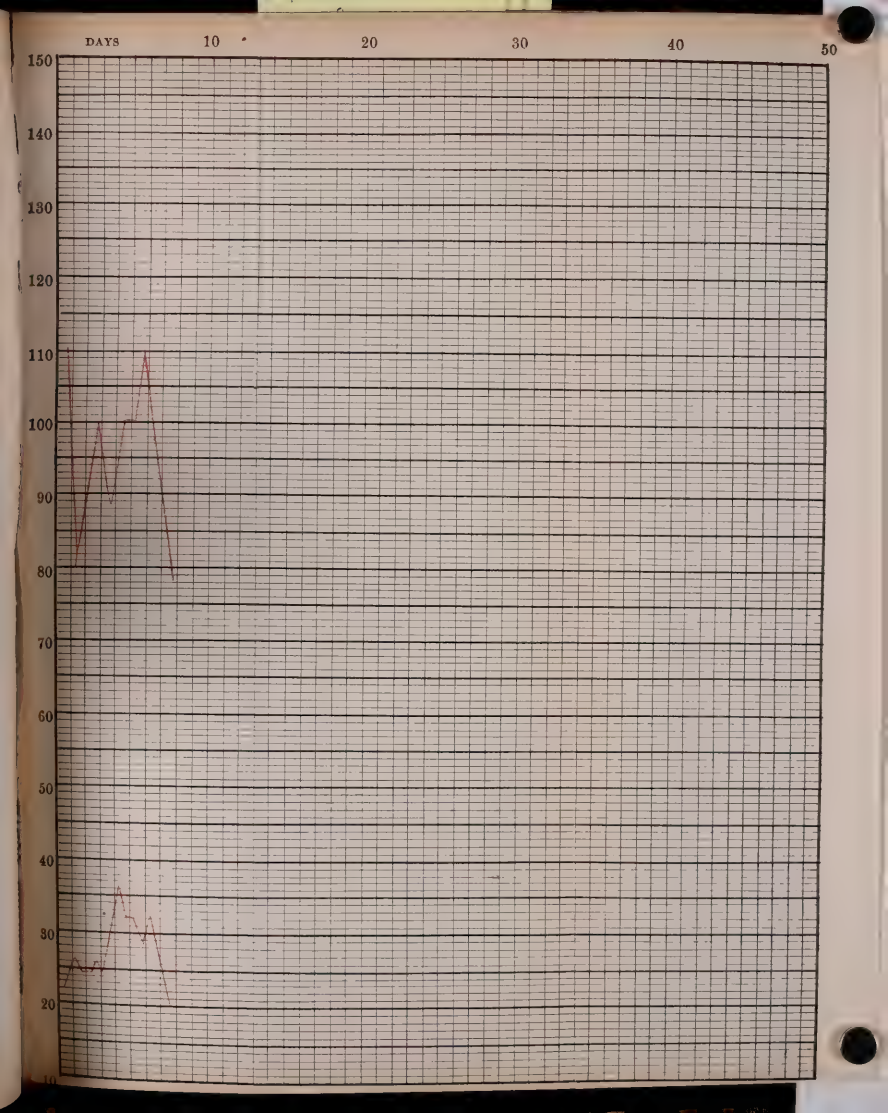
The autopsy was made 18 hours after death. The body was very much emaciated, and the head rigidly retracted. The dura mater was adherent to the calvarium, so that it had to be removed with it. Underneath it the arachnoid membrane, both on its parietal and visceral aspect, was preternaturally dry, and where it bridged over the subarachnoid spaces, was thickened and opaque; and lymph was deposited in considerable quantity at the base of the encephalon, in the anterior and posterior subarachnoid spaces, so as to cause complete occlusion of the cerebro-spinal opening, and along the course of the cerebral nerves. There was no remarkable congestion of the vessels of the pia mater. The sulci, between the convolutions, were almost hidden, and the convolutions themselves greatly flattened, owing to the intraventricular pressure. On section of the hemispheres the lining membrane of the ventricles was found thickened; the ventricles themselves—the lateral, the third, and the fourth—distended with fluid, and their channels of intercommunication—the foramen of Monro, and the aqueduct of Silvius—increased in size and thickness. This great collection of fluid in the ventricles, which was apparently due to the occlusion of the cerebro-spinal opening, seems to have been the immediate cause of death.[a]

In the upper cervical region a considerable quantity of dark venous blood escaped from the structures when divided. Greenish lymph was found deposited in flakes all along the posterior aspect of the cord. No evidences of disorganization of the nervous substance could be detected. The cord was preserved, and subjected to a process of hardening. We subsequently examined it microscopically, but no lesions of its substance were discovered.

[a] Vide Hilton's Lectures on Rest and Pain, p. 33.

W. H.


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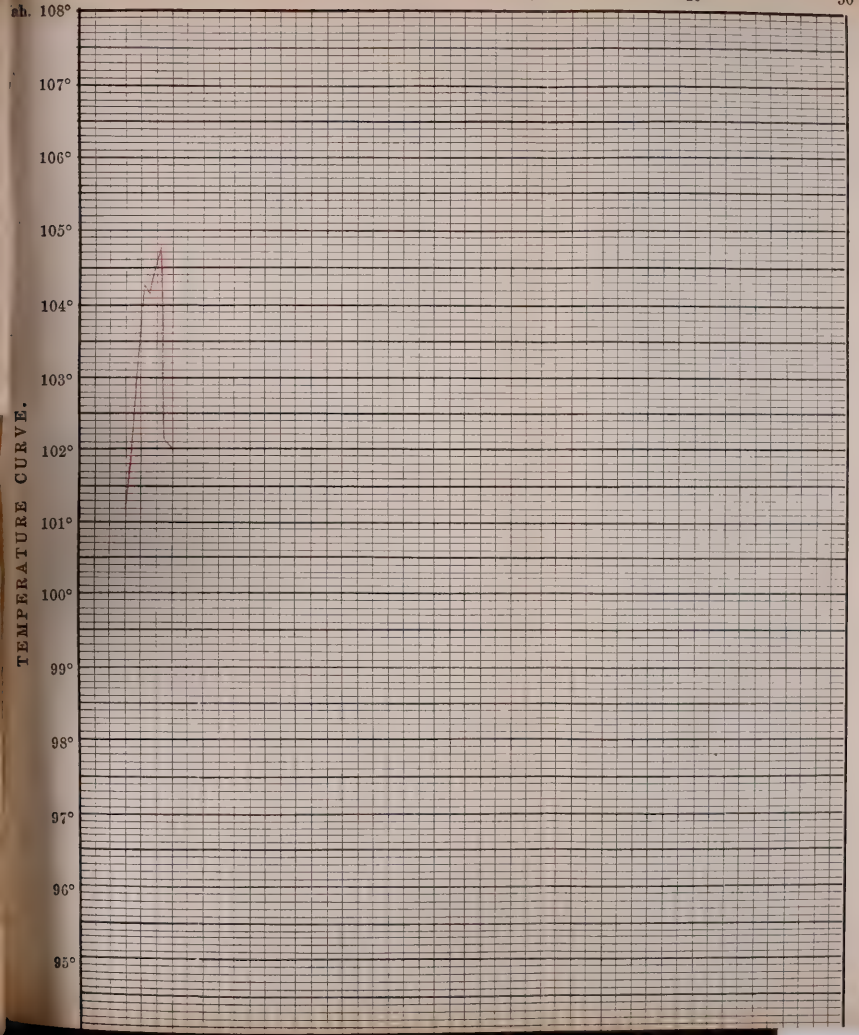

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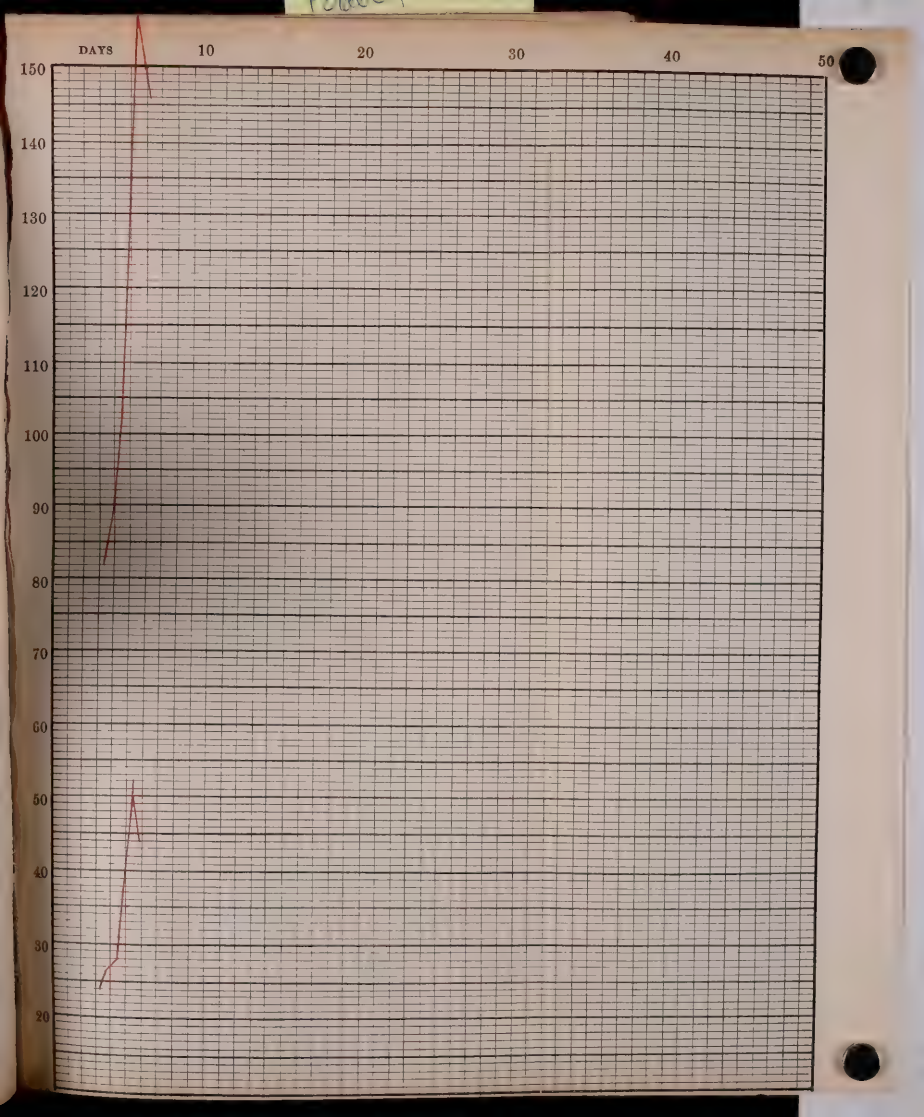
W. H., aged 22. This gentleman's illness, which unhappily was destined to prove so deeply interesting, was ushered in at 11 p.m., by a stiffness in his neck which caused all movements of his head to be attended with considerable pain. He thereupon retired to bed; but was attacked at 3 a.m., having passed a very restless time meanwhile, with vomiting and violent diarrhea. He felt at the same time very hot and thirsty, and complained of a feeling of suffocation, which he attributed to a great collection of mucus in his throat. The purging and vomiting soon ceased. Throughout that day he continued to complain of difficulty of swallowing, transient headache, great pain in his thighs and legs, aggravated by the slightest pressure, and slight pain in the back. In the course of the evening it was deemed advisable to remove him from his residence to a private ward in Sir P. Dun's Hospital. He was then quite conscious, and conversed rationally with those around him. His upper and his lower extremities, especially the latter, were covered with large ecchymotic spots, which evidently consisted of blood extravasations into the true substance of the skin, as they were not raised and did not fade on pressure. These spots, though indistinctly seen during the morning, had first become clearly defined at 4 p.m., according to Dr. H. Kennedy, his medical attendant, who had closely watched the progress of their development. The stiffness of his neck still continued, unattended, however, with any retraction of the head. His legs were exceedingly painful, seeming to possess a morbid sensibility, and his fauces were of a deep-red colour. At 4 the following morning he began to complain of severe pain shooting round from the spine through the hypochondria and epigastrium. Owing to this pain his breathing was very hurried and laboured. At 9 a.m., he was still conscious, complained of the stiffness of his neck, and answered questions addressed to him; but, his manner was more stupid. His temperature and pulse had fallen considerably. Shortly afterwards a bluish-yellow tinge overspread his features; he suddenly became unconscious, and at the same time very restless and excited. This temporary excitement, however, soon passed off, and he lapsed into a state of coma. About 4 p.m. he showed signs of renewed consciousness, spoke a few words, and swallowed some beef-tea, holding the cup from which he drank it himself. Four hours later he again became very restless, crying peevishly, and desiring to get out of bed. He spent a very restless and sleepless night. In the morning (3rd day) he fell into a doze for about an hour and several very dark stools passed from him. The catheter was introduced, and a small quantity of highly coloured urine, containing blood, was withdrawn. The introduction of the instrument, though effected with all gentleness, gave him considerable pain. It was, therefore, surmised that the blood might have come from the urethra. The spots on the legs were of a brighter colour. Apparently unconscious, with his eyelids closed, he kept constantly

muttering over some Greek sentence, which was unintelligible—the burthen of it being, '*ὦ κακά κακά.*' And yet there were times when he seemed to possess a slight amount of consciousness, and answered questions put to him; but, he immediately relapsed into his former state. He again passed a very restless night, rambling much. The following morning (4th day) he seemed quite conscious. His tongue was moist, and covered with a brownish-white fur. The spots were still brighter in colour. His pulse was full and strong, and he only complained of slight pain in his head and throat. A blush of redness, which had been first noticed the previous day, upon the knuckle of the right middle finger still continued, and a similar blush made its appearance upon the lower part of the thumb. Throughout the day he continued conscious, but raved a good deal. In the evening he again became very restless. The next morning (5th day) he was quite conscious, and answered questions rationally, imagining that he was in his accustomed place of residence. The lips and angles of his mouth in many places were covered with herpetic vesicles. The erythematous blush over the joints had not faded. Other large patches of a similar character had made their appearance on both elbows, especially the right; and a few such spots were observed on the ankles. On the seventh day purulent herpetic vesicles were found at the alæ nasi. He had passed an uneasy night. The spots had much faded and showed a tendency to scab. The erythematous patches were also paler in colour; but a few fresh patches had appeared on the toes. He was quite conscious and seldom rambled. During the next day this apparent amendment continued. He only complained of slight pain in his head; and so much better did he seem that his friends were most anxious that he should be pronounced out of danger. The urine this day was examined microscopically, and the deposit, which was exceedingly copious, was found to consist wholly of pus. The sanguine hopes which were entertained of his recovery were not destined to be realized, for, on the following morning, the ninth and last day of his illness, at 4 a.m., partial right hemiplegia set in, with increased stiffness of his neck, and at 9 a.m., he suddenly died.

An examination of the cerebro-spinal centres alone could be obtained It was performed twenty-eight hours after death. An unusually large amount of blood issued from the scalp. On removing the calvarium, the Pacchionian depressions were found to be very large, and corresponded with a vast mass of Pacchionian bodies underneath, which were firmly adherent to the dura mater. These aggregations of Pacchionian bodies were so hard in some places as to communicate to the finger the feel of bone. They were symmetrically deposited on each side of the superior longitudinal sinus. The large veins which ran towards the sinus at this point were remarkable for their size and intense vascularity; and, on the right side, at the point of junction of the largest of these veins

MARY ANNE WALSHE.




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with the sinus, a large coagulum was found completely occluding the vein. The dura and the pia mater, cerebral and spinal, were intensely congested. The numerous patches of capillary congestion of the pia mater, covering the anterior lobe of the right side, gave to it an unusually red colour. The surface of the arachnoid had a dry and greasy feel, and it was adherent to the anterior clinoid processes. In some places it was opaque, and greenish lymph was deposited beneath it in very considerable quantity. This, in some parts, seemed to have been deposited for some time, in others more recently. The situations in which it was more particularly abundant, were at the base of the brain in the circle of Willis, completely surrounding the optic commissure; on the pons Varolii and medulla oblongata; on the superior surface of the cerebellum, in the fissure of Bichât, more especially on the left side; in the velum interpositum; and along the posterior aspect of the spinal marrow, increasing towards the cauda equina. The cerebral convolutions were considerably flattened, and the vessels occupying the sulci were gorged with dark blood. A very large quantity of blood, mixed with matter resembling pus, issued from the internal carotid vessels when they were cut, especially from that on the right side. The puncta cruenta, on section of the brain cerebellum and spinal cord, and the parts composing the floors of the lateral ventricle, all, by their great vascularity, bore evidence of the intense congestion. The lateral ventricles, as also the fourth, and the spinal subarachnoid spaces were filled with a semipurulent fluid, the pressure exercised by which seemed to have been the immediate cause of death; and the parts composing the lateral ventricles, as well as the substance of the cord, in many places, were in a state of complete disintegration. No pus could be found in the affected joints, but a quantity of pus, or greenish lymph, was found in the areolar tissue surrounding the joints.

Mary Anne Walshe, aged eighteen. Previous to the date of her illness, this girl had habitually complained of headaches, and, in the opinion of her relatives, had been a little foolish. She was attacked with retching, and she twice vomited a fluid resembling water, complaining at the same time of pains in her right side and head. That night she became delirious, frequently screaming out for some one "to help her side and head." During the following morning she became quite stupid, and remained in that state till she was admitted into Sir P. Dun's Hospital. On the evening of the fourth day, the day on which she was admitted, she was insensible. Her head was far retracted, and the deep cervical muscles rigid. The heart's action and the pulse, as also the respiration, were regular but laboured. The throbbing of the carotids was remarkable. No eruption could be detected, save a few vesicles of a red colour on the right hand and knee. Of those on the knee, one or two contained a small quantity of pus. The right pupil was more contracted than

its fellow on the opposite side. The tongue was loaded with sordes. She could not be got to swallow anything. Her urine escaped involuntarily. She continued in this state during the following day. On the sixth, loud bronchial rales were audible over the chest, her pulse and respiration had risen to an exceedingly high rate, and she bore a much more dusky aspect. She opened and shut her eyes frequently, and followed with her eyes those engaged around her, without uttering a word, still continuing in the same heavy, lethargic state, with her head retracted, swallowing with difficulty, and passing everything under her. On the following morning (7th day), she was found with her eyes open, looking about her; and, to the astonishment of those around her, she was able to answer questions. She complained merely of pain in her head and neck. Both pupils were normal. Sordes covered her lips and gums. The pulse was rapid, small, and feeble; the heart's action weak and hurried. She died the same evening apparently from exhaustion.

The autopsy was performed sixteen hours after death. The dura mater was normal; the arachnoid slightly moist and free from any deposit. The pia mater, however, was intensely injected, so as to present a bright red appearance. Small collections of green lymph were found scattered here and there upon the surface of the posterior lobes, anteriorly along the distribution of the fissure of Silvius on both sides, and in the middle subarachnoid space, between the oculomotor and trochleator nerves. It was, however, deposited in greatest abundance upon the superior vermiform process of the cerebellum, under the great fissure of Bichât. A small amount of turbid serum was found in the lateral ventricles. The theca vertebralis was normal. Anteriorly the cord appeared quite healthy, save that the spinal vessels were very full of blood, especially towards the cauda equina. The posterior vessels were much more congested than the anterior, and were in some places exceedingly tortuous. The pericardium was preternaturally dry, resembling parchment.

Anne Doyle, aged eighteen. This girl's illness commenced by a feeling of weakness while she was at her devotions in chapel. She came home half an hour afterwards and fell upon her knees to perform her usual duties before going to bed. Her aunt, noticing that she remained a longer time than usual on her knees, and thinking that she had fallen asleep, called to her. She then commenced to sob and cry—a circumstance very unusual—and went to bed complaining of not being well. She remained quiet till midnight, when she started up in bed and vomited some fluid of a bright green colour. Subsequently she vomited twice or thrice, but only threw off fluid resembling water. Severe purging then set in, with great thirst and intense heat of skin. She also complained of great pain in her head and of sore throat. She

answered questions rationally, but immediately afterwards her mind seemed to wander. The next morning she complained that her right arm was sore and would not allow it to be touched, nor did she herself use it. This passed away about four p.m. When visited in the course of the afternoon by Dr. Chapman her face, body, and extremities had large, very dark, and, in some places, black spots of irregular shape scattered over them. They were neither raised above the surface, nor did they fade upon pressure (nor did they disappear after death). They varied in size, in some places being exceedingly small, in others fully as large as a sixpenny piece. They had no definite shape, and their margins were exceedingly irregular. These spots had not been noticed by her friends till they were pointed out to them by Dr. Chapman, though they had no doubt appeared before that time. Shortly afterwards she ceased to reply to questions addressed to her. When brought to Sir P. Dun's Hospital at 11.30 p.m. she was in a state of profound collapse. No pulse could be found in any part of her body. Her extremities, as also her face, were deadly cold and blue. The temperature taken in the axilla was 93°.3 Fah. She was covered with the eruption already described. Her eyes were fixed and staring; the pupils equal, widely dilated, and insensible to the stimulus of light. Her breathing was laboured, numbering fifty-two respirations in the minute; her heart's action rapid and very feeble. She had no retraction or stiffness of her neck. She lay upon her back, speechless, unconscious, with her eyes open, fixed, staring, and meaningless. In this condition she remained, moaning at intervals, tossing her arms wildly about, grasping at imaginary objects in the air, and picking at the bed-clothes, till she died at 3·30 a.m., four hours after her admission and thirty hours after seizure.

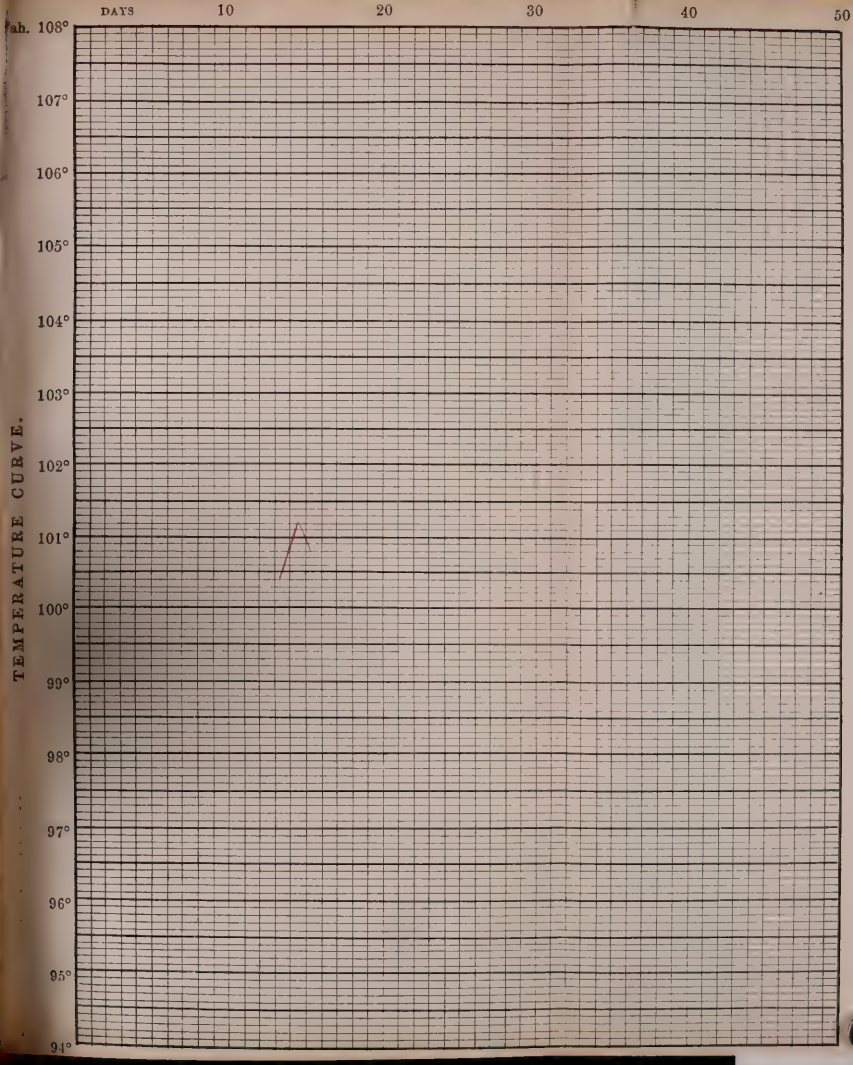
The autopsy was performed 8½ hours after death. The dura mater was exceedingly red, and was almost universally adherent to the calvarium in the mesian line, especially at the vertex and posteriorly. Lymph was deposited in many places beneath the arachnoid, between it and the pia mater. The latter membrane itself was intensely injected everywhere. Numerous puncta cruenta, from which blood oozed, appeared on section of the cerebrum and cerebellum. In the lateral ventricles there was some bloody serum. The choroid plexuses and velum interpositum were very vascular. The venæ Galeni were very large and filled with blood. Several veins were seen ramifying on the corpora striata; and the right corpus striatum exhibited a large vascular patch, into which several veins ran from the choroid plexus. A small cyst lay in the anterior portion of the choroid plexus on the left side. The dura and pia mater were intensely congested at the upper part of the cord, and all the nerves constituting the cauda equina were covered with a network of red vessels. A quantity of serous fluid flowed from the subarachnoid space. The spinal vessels were tortuous and very vascular.

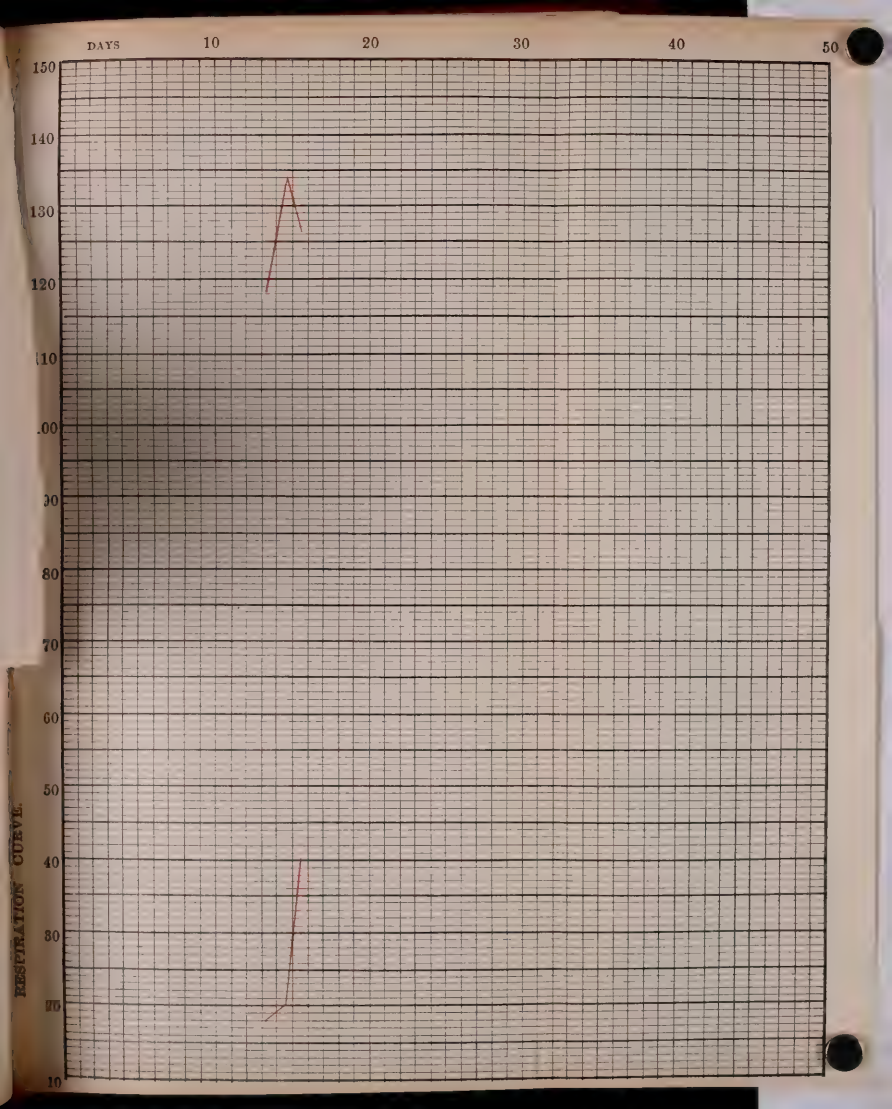
Greenish lymph was found deposited all along the posterior aspect of the cord, more particularly at its lower region. Section of the cord showed numerous bleeding points. The medulla spinalis was hardened and examined microscopically, but no lesion could be detected. The intestines were found studded here and there with ecchymoses in every respect similar to those observed on the skin; and like spots were observed on the heart—one upon the anterior surface of the right ventricle lying on a mass of fat, many on the posterior surface of the left ventricle. The lungs were intensely congested. The uterus was full of bloody debris.

Thomas Devine, aged eleven, Tallaght. This boy had suffered from severe headaches for some time previous to his present illness. On Tuesday, April 28th, 1868, however, after coming in, he sat down without saying anything. For some time he made no reply to questions addressed to him. At last he stated that while out he had been frightened by the appearance of a black man "so tall that he could not see the top of his head," that this man had in some way menaced him; and that, in consequence, he had run home. Shortly after this he went to bed, and soon began to complain of intense pain in his head, particularly in the region of his forehead. So great was this pain that he continued to cry out "Oh my head." On the following morning he vomited a small quantity of a yellowish fluid. His skin felt hot, and he perspired freely. Suffice it to say that the pain in his head grew more and more intense, so that day and night he continued screaming out by reason of it. A few days subsequently he began to complain of pain in his neck and back; and his head became slightly retracted. He roared when touched or moved. He raved more or less; and his bowels remained constipated till after the administration of Ol. Ricini on the eleventh day, when the constipation was succeeded by purging.

He was removed to the Meath Hospital on the fourteenth day of his illness. He was then in a semi-conscious state, lying with his eyes half closed. When sharply and loudly addressed, he dreamily answered without opening his eyes. His head, as he lay was slightly retracted; but, when he was raised, it could be brought forward so as to be on a line with the rest of the spine. This, however, evidently caused him pain. His neck was rigid and could not well be moved from side to side. He passed his urine and feces involuntarily. There was considerable muscular, but apparently no cutaneous, hyperesthesia. His pulse was full and regular; and the respiratory and cardiac sounds were normal. Some minute indelible spots appeared on the chest. He complained of pain in his forehead. There was slight conjunctivitis, and some slight sub-conjunctival ecchymosis on the right side. Both pupils dilated equally, and there was no impairment of vision. Examined by the ophthalmoscope the inner, though of course apparently the outer, half of both

THOMAS DEVINE, Æt. 11.




DAYS
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10
RESPIRATION CURVE.

optic discs, especially of the left, appeared much redder than natural; and the redness of the inner half contrasted strongly with the outer half of each papilla, which was even whiter and more glistening than normal. His tongue was covered with a dry brown fur.

On the following, the fifteenth day, he lay with his eyes closed, quite unconscious, and insensible to everything passing around him. He had not spoken since the previous day. He passed his evacuations involuntarily. Both pupils were equally dilated. There seemed to be complete facial anesthesia; for, the eyelids and the globe of the eye itself could be touched without any evidence of this being evinced. The most severe pinching of the face called forth no expression of uneasiness, though, when this was tried elsewhere, uneasiness and other evidences of sensibility were manifested. The purging continued. The pulse was much more thready and small; and the heart's action more rapid. Besides the eruption already described, a few erythematous patches had appeared on the arms.

On the sixteenth day he continued quite insensible. The condition of the pupils had changed; one, the left, was now dilated, while the other was contracted. The pulse was feeble, rapid, small, thready and irregular. Loud mucous râles were audible all over the chest; and his breathing was very laboured and hurried, owing to the quantity of mucus in the lungs and bronchi. He died at 11 a.m. No *post mortem* examination could be obtained.

PROCEEDINGS OF THE PATHOLOGICAL SOCIETY OF DUBLIN.[a]

Dr. Gordon, President.

Phthisis with Phthisis Laryngea.—Dr. MacSwiney exhibited the viscera of a man aged about fifty years, who died in Jervis-street Hospital. He was in hospital altogether for about a week, having entered it in an exhausted and moribund state. Both lungs were the subjects of very extensive tubercular deposit, the tubercle existing in a variety of stages. In some parts as a small semi-transparent grey "nascent" tubercle in some as masses of yellow infiltrated tubercle; while in other parts the abnormal deposit had been converted, by an attempt at cure, into a hard gritty cretaceous substance; and in the apices of both lungs, more especially the right, there existed large vomicæ half filled with a liquid consisting of pus, broken down lung-tissue, and blood. The case also afforded a good specimen of the pathological products of that variety

[a] These reports are furnished by the Secretary to the Society.

of tuberculosis known as laryngeal phthisis. The patient, upon admission, had considerable but not total loss of voice, and he complained of pain in the back of his mouth and throat, so great as to have almost abolished the power of swallowing. He said he was dying of starvation, as he was unable to swallow any nourishment. An inspection of the larynx demonstrated the extent to which it had been the subject of the tubercular disorganization. All its structures were thickened apparently from the deposit into their interstices of scrofulous matter. The vocal chords were nearly destroyed, and the mucous lining of the tube very much abraded. In many parts of its interior small superficial patches of ulceration existed. These were probably at first the seats of deposited tubercle, which, in the progress of the disease, had broken down and been expectorated.—14*th Dec.*, 1867.

Destruction of Hand by Machinery.—Mr. Collis said it would be difficult to recognize in the specimen presented to the Society the features of the human hand. The subject of the accident was a young girl, who, while feeding a turnip-cutting machine, got her right hand entangled in it, and immediatety all these terrific injuries were inflicted. There were twelve lines of incision at the distance of a quarter of an inch from each other, going right through not only the entire of the fingers, but through the metacarpal bones, which were denuded and splintered. From the enormous amount of injury in the palm and dorsum of the hand it was manifest that there was no alternative but amputation at the wrist, which was accordingly performed. Mr. Collis performed the amputation by the double flap through the wrist-joint. He did not interfere with the cartilages of incrustation for two reasons: First, there is no reason why they should be removed, as they do not interfere with the primary union of the stump; secondly, cut surfaces of bone are more liable to phlebitis from the exposed and wounded mouths of the numerous vessels which ramify through the cancellated tissue; while the sharp edges of recently divided bone are naturally more irritating to the raw surface of a flap than the smoothly-covered articulating end of the bones. He used acupressure with complete success, and brought the edges of the stump together by harelip pins, and dressed the wound with a lotion of carbolic acid for the purpose of destroying the fetor of pus, and rendering it unnecessary to interfere with the dressing at too early a period. There was, however, no discharge, the stump healing throughout by primary union, with the exception of about half an inch at one corner, where the integuments had not lain in accurate apposition. Even here there was a superficial granulating surface. It was the first case in which he had seen primary union throughout the entire tissues of a stump.—*Dec.* 21*st*, 1867.

Fibro-cystic Tumours in the Abdomen.—Dr. Lyons said the patient from

whose body the parts now exhibited were taken was a female, aged 45, the mother of several children, and until about 12 months since in the enjoyment of pretty good health. The chief features in her case were great abdominal tumefaction, occasional attacks of severe pain, and at intervals difficulty in micturition.

This last symptom appeared to be attributable to change in position of the tumour, which at times pressed on the ureters and bladder, and in a day or two afterwards the tumours seemed to undergo a kind of passive locomotion, and to get from off the ureters, and the urine immediately flowed in great abundance.

Dr. Lyons said this train of symptoms reminded him of an extraordinary case in which something similar took place. There was a total retention of urine for seven days caused by tumours pressing on the ureters. Uremic convulsions came on with great violence, and the convulsive movements of the body seemed to have the effect of working the tumours off the ureters, and an enormous quantity of urine instantly flowed, which drained through the bed and came down on the floor. The symptoms were relieved, but the patient survived only a short time. In the case now before the society the patient gradually sank, worn out and exhausted; and on the 7th inst. the *post mortem* examination was made. The tumours proved to be somewhat different from what he had expected. A large mass was found occupying the left iliac region; and another large tumour occupied the right iliac region. A third was situated in the superior part of the abdominal cavity, partly lying on the spine and pressed forward towards the umbilicus. This appeared to be the floating tumour which was moved backward and forward from the motion of the intestines, and was the seat of so much pain during life. On making an incision through this tumour it was found to be of a fibro-cystic character, it was of a very close and dense structure, having disseminated through it cysts varying in size. There was one very large cyst capable of containing a large hen-egg; next to it there was another also of large size and partly communicating with it; and there were two or three others at opposite sides of the tumours. The tumour which occupied the left iliac region was smaller than the opposite one, but its structure was denser throughout and the cysts were smaller and fewer in number. The next in size was the movable tumour which had the peculiarity not only of showing the dense structure throughout and some cysts, but a calcareous degeneration had taken place in the centre of it, proving that this tumour must have been in existence for a long time. Another of these tumours of considerable dimensions also was solid nearly throughout, and presented at its extremity two or three cysts. The contents of the cysts were alike, being a thick, serous, oily fluid, which exhibited albumen in great abundance on the application of the nitric acid. There was one close to the

junction of the ilium and the cecum floating about and attached to a very loose pedicle. One occupied a peculiar situation, and he was greatly surprised that it had not caused greater mechanical distress and suffering. It was attached to the fold of the mesentery, close to the insertion of the ilium into the cecum, and there it had compressed the ilium to an extreme degree so as to interfere considerably with the passage of fecal matter.

Dr. Lyons proceeded next to examine the uterus, and found the vagina intact, the os and cervix uteri not changed; there was a little vascularity at the orifice, but nothing more. In the wall of the uterus there was found a quantity of fibrous structure deposited.

The ovaries were not affected. These tumours appeared to have originated in the lymphatic glands, and then in the mesenteric glands here and there. They formed a globular mass, and some were detached and connected with the mesentery only by a very small pedicle.

The case was one of unusual interest, because of the great number of the tumours, and the peculiarity of this fibrocystic degeneration and calcareous deposit. The tumours had altered much in appearance, resembling in appearance on section encephaloid matter much more now than when they were first examined, but minute examination showed the true fibrocystic nature of the growth.—*January* 11, 1868.

Cancer of the Thyroid Gland and adjoining Lymphatics.—Dr. Stokes said the parts which he now submitted to the Society were taken from a man of 50 years of age, who had died lately in the Meath Hospital. He was admitted labouring under a prodigious distension of the neck, and, at the first blush, one would say it was a case of an extreme degree of bronchocele, for the tumour occupied both sides of the trachea, and looked extremely like the enlarged thyroid body. There were some circumstances, however, about the case, which led him to doubt this, and one of these was that the man was suffering from dysphagia. The dysphagia was œsophageal, not laryngeal—not the difficulty of swallowing, with coughing, which exists when the epiglottis is engaged, but was referred to a point lower down, beneath which no solid food could pass, but he was able to take liquid food. On closer examination, it was found the tumour was of unequal hardness—in some places there was a sensation as of cystic fluctuation, in other parts a stony hardness. The voice was affected, but in a curious way. He was not completely aphonic, but considerably so, and the aphonia was constant in degree and character. It had not that varying character which was seen in cases of aphonia produced by the pressure of an aneurism on the recurrent nerve, but quite constant. Under these circumstances, he came to the conclusion that it was a cancerous development of the thyroid gland. He was right in this opinion, but not correct in holding that the whole tumour was the thyroid gland. It would appear that the lymphatics of

the anterior and posterior mediastinum were the principal seat of the disease. A very remarkable appearance was exhibited during life, namely, the extreme dislocation of the trachea. The thyroid cartilage was pressed far over to the left side of the mesial line, and from that point the trachea could be traced downwards. The two circumstances which led him to diagnose carcinoma were, first, the sensation which the tumour gave to the hand; and, next, the extremely rapid growth of this vast mass. The patient was ill only five months. Another symptom which this patient had was a considerable amount of stridulous breathing; but, upon placing the head close to the front of his neck, it could be easily perceived that the stridor was above and not from below. In many cases of aneurismal pressure on the trachea, it was not difficult to determine that point, if the top be the point at which the stridulous sound comes forth; but in this case the stridulous sound evidently proceeded from the larynx itself. He did not say that this distinction obtained in every case of intra-thoracic pressure on the trachea, but it did in a great number.

The tumour was very large and had grown principally from the right side, and dislocated the trachea. It was a vast encephaloid mass. There was another tumour in the anterior mediastinum of the same character, very similar to the structure of the brain; and there was a third tumour in the posterior mediastinum, which was that which intruded on the œsophagus. The diseased thyroid gland was also exhibited, which, from its situation, gave the appearance of inequality to the two tumours during life. That which was supposed to be the right lobe of the thyroid gland was really not so at all. The left portion of the tumour was composed of both lobes of the thyroid gland, and the thyroid gland itself was also in a state of cancerous degeneration. There was no cancer of the lung or of any other organ of the body. It had been held by some pathologists that cancer was not to be enumerated as one of the affections of the thyroid gland, and that when cancer did engage the neighbourhood of the gland, so as to simulate cancer of that body, it was really cancer of the lymphatics about it. That might or might not be so originally; but in this case there was cancer of the lymphatic glands all round, and also cancer of the thyroid gland itself. He had been able to find very few cases on record of cancer of the thyroid gland. In the *Year Book* of 1859 there were five cases recorded by a German pathologist, and in the records of the Pathological Society, of which however, he had not been able to make a complete search, he found one case communicated by Dr. Quinlan, in the year 1859.—*January* 11.

Depressed Fracture of Skull.—Dr. Corley exhibited a section of a skull in which he had performed the operation of trephining. He gave the following details of the case: Mary Fitzgerald was admitted

into Jervis-street Hospital at half-past eight o'clock on the 18th of December. A few minutes previously, her husband, during a domestic quarrel, had struck her on the head with a three-legged metal pot, full of potatoes. One of the legs struck her on the left side of the head, immediately above the zygomatic arch, and rather closer to the ear than to the edge of the orbit. There was immediate and copious hemorrhage, and after uttering a single sentence she became insensible. She was in this condition when first admitted; and there was some obscurity in the symptoms, from the fact that she was said to have been drunk at the time of the assault. I saw her three hours after, and she was then in profound coma, apparently from compression of the brain, with a full labouring and intermittent pulse of 50, respiration slow, stertorous, and accompanied by flapping of the cheek, pupils dilated and temperature of skin increased. The wound, the bleeding from which had been with difficulty controlled, was small and crescentic, and scarcely admitted the finger in examination. The rent in the aponeurosis and substance of the temporal muscle could be felt, and then a depressed fracture situated at the anterior inferior portion of the squamous plate of the temporal bone. The copious bleeding having rendered venesection as a remedial measure inexpedient, and a large purgative enema having failed to abate any of the symptoms, I determined to remove the most obvious cause of the compression; and the increasing difficulty of the heart's action (as manifested by the character of the pulse and commencing coldness of the extremities) forbidding delay, at two o'clock on the morning of the 19th, assisted by my colleagues, Drs. Meldon and White, I proceeded to elevate the depressed bone. I may remark, concerning the operation, that on raising a flap of the temporal muscle the hemorrhage was so severe as to necessitate the keeping a compress in the lower part of the wound while I worked the trephine on the sound bone above, and when the elevator was applied the broken pieces were felt so loose that any attempt to raise them permanently was futile. I therefore resolved to remove them altogether, and as they were already, by the original violence, partly detached from the dura mater, I had no difficulty in separating them completely with a small forceps guided by my finger. It will be seen that the principal difficulty of the operation arose from the fact that the lower portion of the depression was absolutely under the zygoma, and its precise condition could only be ascertained by touch. A good deal of blood welled up from the bottom of the wound; but, for the reasons I mentioned, its exact source could not be seen, and it ceased directly on laying down the flap. Some signs of amendment immediately followed the operation. The patient moaned, vomited, her breathing became perfectly tranquil, and her pulse rose. There were some movements of the right side of the body, which had previously been quite inert, but there was no return of consciousness. Three hours afterwards her respirations

were 24, pulse 114, and during the whole of the day she remained in much the same condition. Towards the evening both pulse and respiration became more hurried, and continued to increase until she expired at four o'clock on the 20th, 38 hours after the operation. The *post mortem* examination showed the condition now exhibited. The portions of bone (three in number) when fitted together show that the fracture was stellate, depressed in the centre of the star, and that the sharp edges had lacerated the dura mater in three places. When that membrane was opened the infero-lateral portion of the middle cerebral lobe presented a laceration into which the tips of three fingers could be inserted; but the most striking feature was the presence of a thick layer of coagulated blood covering the upper and outer surface of the left hemisphere, and flattening it to a most perceptible degree. The consideration of greatest interest about the case is the source of the effused blood, whether from a torn branch of the meningeal artery or from the lacerated cerebral vessels. The fact that one of the pieces of bone depressed presented a meningeal groove would point to the first conclusion, while the ease with which the external bleeding was stopped after the operation seemed to indicate the second. The result of the conclusion as regards the practice, would not have signified much, as even had it been diagnosed as arterial, from the nature and position of the injury, there would have been no other means available for controlling it than those used.

As trephining is an operation which has lost ground in professional estimation of late years, I have been particular in giving the details of a case in which the absence of a successful result cannot be attributed to the operation which, determined on as a last resource, accomplished the objects for which it was performed, namely, the removal of the compression by bone.

Large Urinary Calculus in the Female.—Mr. Porter said, on looking back through the records of the Pathological Society, he could not find that urinary calculus disintegrated by the lithotrite had ever been laid before them. Firstly, then, for that reason, and, secondly, because the disease was so seldom found in the female, he thought that it might not be uninteresting to exhibit the present specimen. He removed the stone, which he now held in his hand, from a patient in the Meath Hospital. She was a woman aged 45, and prior to her admission to hospital she had been suffering for a year and nine months from extreme irritability of the bladder, and at times most excruciating pain. About four months ago, she placed herself under the care of a medical gentleman in the country, and he looked upon her case as one of uterine disease, and treated her by the application of caustic to the os uteri. She received no benefit from the treatment, and was sent by a lady who

took a great interest in her to Dr. E. Kennedy, and he for the first time introduced a catheter into the bladder, and discovering the presence of a large caculus, sent her to him (Mr. Porter), and she was received into the Meath Hospital. On admission, she was suffering very much. She was admitted on the 24th of December, and she stated that on Christmas-day she was disturbed so frequently as eighteen times in one hour. Dr. Kennedy had had the urine analyzed by Dr. W. D. Moore, and the following was the result of his examination :—

The urine extremely turbid, highly albuminous, strongly alkaline, free from sugar, and contained but little urea. The specifiic gravity 1·015. On standing it deposited an enormous amount of ropy pus, entangling numerous blood-corpuscles, and crystals of triple phosphate, some epithelium, and earthy phosphates. Vibriones also, but not in motion.

The woman was now quite well, and the night before she left hospital for home she slept from ten o'clock until seven in the morning, without being disturbed. On a most careful sounding not any of the calculus could be discovered. He had the nucleus of the stone now in his hand. It appeared to be lithate of ammonia, around which a large phosphatic calculus had been formed. The weight of the detritus, except the small fragments which were lost (as happened in all these cases), was exactly 615 grains. The measurement of the stone, made on the first day of her admission, was one inch and a quarter.—*January* 25.

Œsophageal Obstruction.—Diffuse Inflammation.—Dr. Hayden submitted to the Society a case of œsophageal obstruction, diffuse inflammation, and death, due to the impaction of a piece of bone in the œsophagus. On the 17th of January, a man, aged 66, presented himself at the Mater Misericordiæ Hospital, declaring that he felt obstruction beneath the sternum, in attempting to swallow either solids or liquids. This difficulty, but in a less aggravated form, had existed for the last six months. His pulse was feeble, and slightly intermittent, but there was no evidence of any organic disease whatever. In the course of the night of the 17th, his neck became suddenly swollen, and his breathing greatly embarrassed, no such symptoms having existed at the time of his admittance. When Dr. Hayden saw him on the following morning, he found his neck greatly swollen, especially at the root. It was somewhat red and tender, especially at the left side. There was loud stridulous breathing, with a remarkable gurgling in the throat. No appearance of inflammation in the fauces. The man's pulse was exceedingly weak; all over the chest there were loud bronchitic râles but no other evidence of pulmonary derangement. The heart's action was feeble. Over the ensiform cartilage was heard a rough jarring murmur with the first sound; this did not exist in the heart. On attempting to swallow, the man complained of great pain at a point

corresponding to the lower part of the sternum; he declared that he could not make the liquids enter his stomach; that, to use his own language, "they were stopped at that spot," placing his hand over the sternum. At eight o'clock, p.m., he (Dr. Hayden) was summoned to see the man, who was declared to be much worse. He found him lying on his left side in a semi-recumbent position. There was loud laryngeal stridor; the neck was swollen, the pulse small, the surface cold. He requested the man to swallow some drink in his presence. He evinced great reluctance to make the attempt, but at length consented to do so. He sat up in bed, and made preparation for the effort. He performed the earlier stages of deglutition with the greatest ease, but about two seconds after he had taken the drink, he leaned forward, writhed with pain, placed his hand on the sternum, and said, "it is stopped there." There was no regurgitation, however, and the liquid, after a very brief period, entered the stomach, and then followed complete relief. There was no spitting of blood at any time, nor any history of swallowing or feeling a foreign body in the throat. Under these circumstances, he declined to recommend the operation of tracheotomy, which would have naturally occurred to one's mind in such a case, firstly, because of the existence of obstruction low down, and, secondly, because of the unfavourable issue in a similar case, in which he had performed the operation some years ago. On the following morning, at a quarter past eleven o'clock, the man died of syncope. It would be seen that the parts which he now exhibited showed the existence of diffuse inflammation of the neck. The glottis was remarkably œdematous; the epiglottis was very much swollen, but not red; and the tissues all round were likewise in this state. The walls of the pharynx were thickened and condensed, and the areolar tissue connecting the pharynx and œsophagus with the vertebral column was infiltrated extensively, and in a dark and sloughy condition, the result of gangrenous inflammation. He found about four inches below the larynx two sharp fragments of bone, about an inch in length, impacted in the œsophagus, placed at right angles with its axis, and lying side by side, held in juxta-position by a thin film of membrane, and transfixing the œsophagus at both those extremities. The punctures made by the extremities of the spicula communicated with a peri-œsophageal abscess, occupying chiefly the left side, and containing a considerable quantity of yellow, creamy pus. He was unable to trace any connexion between this abscess and the seat of the diffuse inflammation in the neck, but manifestly while the abscess had not become diffused, inflammation resulting from it had, and was the immediate cause of death. The aorta was atheromatous, the heart fatty, the left ventricle in a state of concentric hypertrophy, consequent on sudden death. The right cavities of the heart, both the auricle and ventricle, were filled with dark, liquid blood. This case was interesting in a diagnostic

point of view. The question arose, considering the murmur at the ensiform cartilage, whether it might not be a case of abdominal aneurism. He dismissed that idea, firstly, because of the absence of abdominal pulsation, and of pain, save on attempting to swallow; and, secondly, in consequence of the occurrence of diffuse inflammation; this could not have been the result of extravasation of blood from an aneurism competent to produce œsophageal obstruction, because, in such a case, death would have immediately followed. The case was, therefore, clearly one of abscess in the immediate neighbourhood of, and probably connected with the œsophagus. Two days after the man's death, when it was too late to have made the information available for a useful purpose, he was informed that, a few days previously, the man had swallowed a bone, whilst eating some bacon. He swallowed the bone, as reported, on Tuesday, and was admitted to hospital on Friday. He himself admitted that for six months previously the obstruction of which he complained had existed. The question arose whether these fragments of bones had been impacted in the œsophagus for a period of six months, or only from the Tuesday preceding his admission. He concluded the former was the case; for he did not think it possible that in a period of two days these foreign bodies could have given rise to an abscess of such large dimensions; and, secondly, because the man traced his illness to a period of six months antecedently. He inclined, therefore, to the opinion that he had unconsciously swallowed this portion of bone six months ago. The kidneys were in an early stage of cystic degeneration.—*January* 25.

Renal Calculus.—Dr. Bennett exhibited a branched renal calculus which he had taken from the body of a man who had died in July last in Sir P. Dun's Hospital.



He showed also specimens taken from the same body illustrative of the changes produced by peritonitis and by gout.

The patient was a middle aged man, a carpenter. For four years previous to his death he had been from time to time under the observation of Professor M'Dowel. At the commencement of that period he was admitted into the Whitworth Hospital suffering from ascites without any general dropsy. He was twice tapped, and the second tapping was followed by apparent recovery. He returned to his work, and continued free from disease for a year; after this interval the disease returned, and he was repeatedly tapped both in hospital and at his own home. In July last he was admitted into Sir P. Dun's Hospital; he was suffering greatly from the amount of fluid in the abdomen. He was unable to breathe lying down, and he was generally anasarcous; his urine contained a considerable quantity of albumen. At his urgent request he was tapped, and the operation was followed by general peritonitis, which was fatal in two days.

On opening the abdomen the usual appearances of acute peritonitis were seen; a quantity of recent lymph was effused over the coils of intestine, and much purulent fluid escaped, but there was evidence of the occurrence of a former attack of peritonitis, probably chronic, in the condition of several of the viscera. The intestines were in many places adherent, the adhesions being old and firm, composed of a substance almost like cartilage. The liver was most remarkably altered in appearance by this deposit; every portion of it except the part which is uncovered by peritoneum was of a pearly white colour; all trace of the normal shape was gone; the bulk of the gland was much diminished, and it had somewhat the appearance and shape of a gigantic testicle; on cutting into it these changes were found to be produced by great thickening and contraction of its peritoneal investment; the white covering was more than a line in thickness and of cartilaginous hardness; the gland tissue seemed healthy, though much diminished in quantity. The spleen was covered by a capsule similar to that of the liver, but it differed from it in the fact that it was capable of being separated from its capsule by very slight force; the tissue of the spleen, like that of the liver, was healthy.

The right kidney was enlarged and pale in colour; its pyramids were streaked with white deposit in the direction of the straight tubes. On microscopic examination the deposit was found to consist of the crystals found in gouty deposits—lithate of soda. The nature of the deposit was verified by the examination of the articulation of the ball of the great toe; this joint on one side was the seat of copious deposit of lithate of soda, which, as the specimen on the table showed, gave the characteristic reaction with nitric acid and ammonia.

The left kidney was converted into an irregular cyst, which was

completely filled with calculous matter; very little of the tissue of the kidney remained in the structure forming the covering of the calculi. The large calculus exhibited weighed 452 grains, and was a complete cast of the pelvis, infundibula, and calyces of the kidney; it presented polished facets on the parts which filled the calyces, and on these facets there rested an immense number of detached calculi and a great deal of gravel. The composition of all the calculi seemed identical. They were all invested with a thin yellowish covering, easily detachable, and the remainder was white, very brittle, and crystalline. A chemical examination of the central portion gave the following result:—

Phosphoric acid, . . .	31·12
Ammonia, ...	8·14
Magnesia, ...	12·52
Lime, ...	14·26
Water, organic matter, and alkaline salts,	33·80
Loss, ...	·16
	100·00

This is reducible to the following form:—

$$NH_4O,2MgO.PO_5+12HO=8$$
$$3CaO,PO_5+\text{trace of } CaO=1$$

This analysis shows that the calculus was a pure crystalline deposit of the mixed phosphates. The only part containing any trace of lithic acid was the investing film.

The composition of the calculi in this kidney differing so widely from that of the gouty deposit on the opposite side is of much interest; it is probable that if a section could be made of the branched calculus, which has not been attempted for fear of injuring so perfect a specimen, that a lithic acid nucleus would be found in its central stalk.—*January* 25, 1868.

Typhoid Ulceration of the Intestines.—Dr. Lyons brought under the notice of the society a remarkable example of typhoid lesion in the intestines. The case was that of a young girl admitted to the Hardwicke Hospital on what was said to be the fourteenth day of her illness, but he thought it extremely likely that she had been ill for a longer period. She was very low when admitted, and had all the well-marked symptoms of typhoid fever, which had been, as all hospital physicians were aware, prevalent to a remarkable degree during the present winter. The patient laboured under constant diarrhea, which was controlled with difficulty. She had an exceedingly feeble pulse, which was at first 108, but gradually rose. When about ten days in hospital she seemed to a considerable extent to be relieved in regard to most of her urgent symptoms. So much better did she feel

herself that she got up without permission and sat at the fire, and thought she had fully recovered from her illness. There was always, however, an unhealthy appearance about her, and Dr. Lyons said he was not surprised to find that she relapsed, and in a few days afterwards she began to pass blood in large quantities; the blood was little altered in appearance, being well coloured and distinctly recognizable blood, instead of the mere ordinary melena. The diarrhea continued, and it is remarkable that she did not complain of local pain. The abdomen was repeatedly examined, and exhibited no tenderness or any great amount of distention. There were other cases in the wards at the time suffering much more severely from diarrhea than she did. The hemorrhage was very copious, and ran her down very much, but she did not seem to die from the direct effects of loss of blood, for no hemorrhage of any extent occurred for three days before her death.

There seemed to be a sudden revulsion towards the pulmonary system, a sudden effusion into the bronchial tubes, and she died from bronchial suffocation.

A *post mortem* was made, and although expecting to find some considerable degree of disease in the intestines, Dr. Lyons said that he was astonished to see what an enormous amount of typhoid deposit there was in the glands and patches of Peyer—not confined to the small intestines but travelling down through the large intestines. On slitting up the intestine they found, higher up than usual in the ileum, a patch of Peyer, highly loaded with deposit, very prominent above the surface, and with large jagged ulcerations. He thought the ulceration appeared to reach higher up and the enlargement of the patches was greater than he had seen in any case recently. It was known that under certain normal circumstances the patches of Peyer were to be found beyond their ordinary limit, and they were noticed occasionally in the jejunum, and even that they had been occasionally found still higher up in the duodenum. In this case they seemed to be in unusually great abundance in the ileum and part of the jejunum, and the amount of ulceration and deposit was very extreme. In cases such as this nothing could be done to save the patient's life; the amount of disease was too great to admit of any remedial agency being applied with benefit. Travelling still further down the intestine the same diseased condition was repeated, but to a more enormous degree. Here were observed excavations one-eighth of an inch and even a quarter of an inch deep. Travelling still further down the lower patches were found more advanced in the lesion. It could be noticed in some of the lower patches which forcibly attracted attention that a great part of the gland structures was excavated, and a large amount of the deposit had been detached. One oval patch, an inch and a half long and an inch in its transverse diameter, was very conspicuous, in which nearly three-fourths of its texture had been eaten

away. Coming to the last patch, occupying its usual position on the iliac aspect of the iliocecal valve there was found immense destruction of the substance; deep-eating ulceration had removed the deposit, which was very thick, and the base of the mucous membrane was laid bare. It was well known that in cases of typhoid lesion of the intestine the morbid process usually seemed to be stopped by a mechanical barrier, as it were, at the iliocecal valve. Even in cases where perforation had taken place, followed by peritonitis, the lesion was not generally found below this valve. In the present case that gate or barrier seemed to have been eaten through, and the disease had passed the limit of the iliocecal valve, and was to be found in a still more inordinate degree in the colon. Few, he ventured to say, had ever seen a more extreme degree of disease than in the colon he now exhibited. First passing into the diverticulum of the vermiform appendix there was found extensive lesion of the glands in this organ. It was of a bright crimson red, and there could be no doubt a great deal of the hemorrhage observable during life had taken place from this portion of the mucous membrane. Travelling down the large intestines further evidence was seen of engorgement of the minute glands of the colon. In their normal condition these minute glands were not readily visible; it was difficult to get evidence of their presence by the unaided sight, but here they were very distinct, rising prominently above the surface, and containing a large amount of deposit in their interior. Here and there patches of the large intestine were deeply ulcerated, and the mucous membrane was almost eaten through. As they passed further down the ulcerations increased in number, but the disease was at its maximum at the upper end of the colon, and chiefly in the cecum or caput coli.

Interspersed here and there, but not very extensively, with the deep deposit in the glands there seemed to be something of a dysenteric exudation in parts of the the intestinal surface. As they passed towards the rectum they found the disease existing to an extraordinary degree; the glands very large—prominent above the surface; the deposit very considerable, in many instances excavated away, and the mucous membrane laid bare. It was only surprising that this poor girl lived so long, and was able to resist that extreme state of disease for such a lengthened period. He had himself seen many cases of this typhoid disease, and he had a large number of examples of it in his museum, which he obtained in the Crimea, and he did not think there was a single specimen exceeding in amount and intensity of deposit what was seen in the present case.—*February* 8, 1868.

Intra-uterine Fibrous Polypi.—Dr. Kidd said the preparations he had to lay before the Society were more interesting in consequence of their number than from anything either in their character or appearance. It

was very well known to pathologists that fibrous tumours growing from the external surface of the uterus were frequently very numerous; but when fibrous tumours, or polypi, arise from the interior of the uterus they do not grow so—in fact, there was seldom found more than one in that situation. Dr. Denham, in the course of last session, exhibited to the society a uterus with fifty-three fibrous tumours growing on the outside of it, and cases where they were still more numerous are on record; but he (Dr. Kidd) did not know of any author who mentioned a number of fibrous polypi growing from the interior surface of that organ. The specimens he now exhibited were polypi that he had removed from the interior of the uterus of a young woman, in the Coombe Lying-in Hospital, who had suffered from menorrhagia for a period of fourteen years. She was thirty-six years of age, of anemic appearance, scarcely able to walk, and her breathing exceedingly short, and the colour of the lip could scarcely be distingushed from that of the cheek, the lip was so completely blanched. The os and cervix presented a healthy and natural appearance, but the body of the uterus was longer than usual; in place of two and a half, it measured three inches. The fundus of the uterus at that time could scarcely be distinguished above the level of the pubes. It could be felt by the bi-manual method of Marion Sims, but could not otherwise be distinguished. On consultation with his colleagues, Drs. Ringland and Sawyer, it was determined to dilate the os and cervix and explore the interior of the uterus; and, on doing so, the three tumours that he now exhibited were discovered growing in the cavity of the uterus, near the fundus, and were removed by the ecraseur. After this the hemorrhage greatly diminished, and she left the hospital, but at that time the uterus had not recovered its normal size—the cavity of the uterus measured three inches in length. She applied again at the hospital, the week before last, saying that the hemorrhage was increasing again. The body of the uterus was now considerably larger than when first examined. It rose above the level of the pubes. The os was completely closed, and presented no appearance of disease. The os was again dilated till a finger could be got into the cavity, and nine tumours were found growing in different portions of it. Three of the tumours were found growing close to the os internum, on the anterior wall. The two largest were at the fundus of the uterus. The others were growing upon the posterior wall. The interest of the case consisted in the great number of the tumours. It was quite possible this second group may have been there in a rudimentary state on the occasion of the first operation. He certainly did not feel them then. If they existed at that time in a rudimentary condition, removal of the other tumours, of course, gave them an opportunity of developing themselves. He inferred that this was the case from the fact of the uterus never having recovered its normal size.—*February* 22.

Aortic Aneurism.—Dr. JENNINGS brought forward a recent specimen of aortic aneurism, as also several casts of the chest taken at different periods during the progress of the case.

The case, he observed, was invested with the deepest interest in every point of view, as well from the unusual duration of the disease—a period of more than ten years—the vast size attained by the tumour, which was as large as a human head, its gradual growth in its earlier stages, during which the patient was able to prosecute his trade for so many years, but particularly from the absence of so many of those symptoms, as well subjective as objective, which are enumerated by authors as characteristic of this affection (in this respect, it might be considered almost unique), and the expression of others, to which, so far as he was aware, attention had not as yet been directed.

The patient, Matthew Evoy, a man of muscular habit, aged forty-four years, who had been admitted into the South Dublin Union on the 29th June, 1867, in apparently perfect health, and had retired to bed on the night of the 1st July without having made the slightest complaint, was found on the following morning in a state of complete insensibility. When seen by Dr. Jennings about eleven o'clock on that day, he was lying on his back, motionless, silent, with closed eyelids and compressed lips, the temperature of his body being perfectly natural, and his respiration tranquil and free from the slightest stridor. When the eyelids were separated the pupils were seen to be natural in size, but completely unaffected by the admission of light.

This state of tranquil immobility, however, was reported by the attendants to have been occasionally interrupted since his admission into hospital by attacks of vomiting and restlessness, his struggles then being restrained with much difficulty, and by indistinct mutterings. The heart's action over the entire precordium was found to be extremely faint and rapid, and the pulses at both wrists strictly similar in character, and equally weak, though strong visible pulsation was observed in the carotid, subclavian, and humeral arteries. A conical tumour, several inches in height, and having a base of considerable extent, with double-heaving impulse, visible over its entire surface, was seen situated over the upper part of the sternum, while a second centre of pulsation, though much less distinct, was observed below the left nipple. In neither situation could any bruit be detected.

When loudly addressed by name he languidly opened his eyes, but made no attempt at reply. When shaken, rather roughly by one of the spectators, he raised his head, and expectorated to a considerable distance, displaying perfect control over the muscles of his mouth.

On the following morning the insensibility was found to be much less profound. He seemed semi-conscious, constantly muttering in an incoherent manner, and was still incapable of being sufficiently roused to

give distinct replies. He still lay on his back with his eyelids semi-closed, the pupils being still unaffected by influence of light. The arterial throbbing in the neck and arms, though still perceptible, had much diminished.

When a cup was applied to his lips he drank with the utmost freedom; his respiration was regular and unembarrassed; he did not suffer from cough, nor could the slightest trace be detected of facial paralysis or deformity, nor any difference in the temperature of the ears. The radial pulses were alike, being small, frequent, and compressible.

The throbbing action in the tumour was not by any means so distinctly double as on the previous day, being now chiefly systolic in character.

Percussion failed to detect any perceptible difference in the resonance of the posterior and lateral regions of the chest, at opposite sides, both yielding sounds of similar and normal clearness, seeming also, when viewed from behind, to retain their healthy relation as to size, and to expand equally during inspiration.

When visited on the following afternoon (July 4th) he was found lying on his right side, and was reported to have passed a tranquil night, the vomiting not having recurred since two o'clock on the previous day. His muttering and restlessness also were much less constant, though his condition as to sensibility and sensation, continued unchanged. The general arterial throbbing was still further lessened, and the pulses at the wrists, were likewise much reduced in frequency, being also soft, very weak, and obliterated by the slightest pressure. The heart-sounds over the precordium were faint, being heard much more distinctly over the tumour, in which the impulse also had resumed its double character, the violence of pulsation being however greatly lessened.

When loudly addressed he occasionally made pertinent answers, though, in general, his replies had not the slightest reference to the subject of inquiry.

On the morning of the 5th, his right arm was found completely paralysed, its temperature, however, being natural. When roused by being shaken, or loudly called by name, he would start as if from sleep, stating his age, trade, name of his employer, or his own, as the case might be. One or other of these replies he invariably gave to any question or command of whatever nature addressed to him. His loss of intelligence was evidently complete, and his compliance with the demands of nature involuntary.

The pupils were now observed to be both normal in size, and to act readily on admission or exclusion of light. His daughter informed us that the paralysis of the right arm had attacked him for the first time about four months previously, when he had been carried home insensible, and that it had disappeared after the lapse of three days, when he again returned to work. She further stated that the growth of the tumour,

which had appeared about ten years previously, after unusual exertion undergone in the launch of a ship, was attended with occasional paroxysms of agonizing pain, which lasted for one or more hours, absolutely depriving him of reason for the time, and then gradually subsiding. The exhaustion, however, of these attacks rendered him unable to work for several days.

This statement, as to the fugitive nature of the paralysis in his first seizure, was verified on the present occasion, when on the following morning, examination showed that it had completely disappeared, though all other symptoms continued unchanged for several days. On the 14th July a marked improvement was observed in the brightness and intelligence of his manner which, from having been dull and heavy, now became lively and vivacious. He made several voluntary observations, and when addressed, promptly replied, though his words had still no connexion with the topic of conversation or with the question proposed. He now also intimated by gesture his want of the urinal, &c. His restlessness at this time was so extreme as to require the use of cross straps over his chest and thighs, without which he could not be kept in bed. In this state he remained until the beginning of August, his intelligence still further improving, when he one day surprised Dr. Jennings not a little by directing his attention to the eyes of the patient in the next bed, which he remarked were very sore, as was the case.

On the morning of the 2nd November he was found to be paralysed in the left arm, its use, however, being recovered after a few days, though not so completely as that of the right had been. During the past four months the tumour had rapidly increased in size, and his manner and appearance had lately again become dull and idiotic, continuing so until the 10th December, when he was suddenly seized with furious delirium. After the partial subsidence of this attack he complained of great pain in the tumour, which he guarded with expanded hands, both when asleep and awake.

When the violence, which continued for several days, had altogether disappeared, his manner became more rational than it had been since his admission. He answered several questions with perfect correctness, as, his name, that he felt better, and when asked his age, replied, "twenty-one or twenty-two," proving that, though he failed in making a correct reply, he comprehended the subject of inquiry. He also, when Dr. Jennings silently moved his lips, as if speaking, at once rose from his seat, said "Sir," and requested him to repeat the question, as he had not heard it.

On the 16th February a difference was for the first time perceived in the radial pulses, the right being eighty and steady; the left rapid and very indistinct. During the course of this day he had two or three convulsions. The lower part of the tumour was seen to be very discoloured,

and even beginning to slough at one point. The oozing of blood, which had commenced from this point a few hours subsequently, was checked on the following morning by the application of sesquichloride of iron and cold. During this interval he lay on his back in a state of stupor, though drinking freely and easily when the cup was held to his mouth.

About five o'clock on this day he, of his own accord and unaided, arose from his bed and went to the fire, where he remained until removed by the attendants; after the lapse of some hours he again left his bed, and continued walking about until morning, moaning in a most distressing manner; and, when he did return to bed, keeping his head bent forward on his knees.

From this date he continued in a state of stupor, more or less profound at different periods, until his death, which occurred on the 26th February, when he gradually yielded to *asthenia*.

The *post mortem* appearances, as described by Dr. Purser, who had been kind enough to conduct the autopsy, and whose valuable assistance Dr. Jennings gratefully acknowledged, were as follows:—

"On removing the calvaria the brain was seen to be considerably atrophied and not nearly to fill the membranes which, in several places, lay folded over it. A considerable quantity of fluid was found in the arachnoid cavity, and subarachnoid spaces, as also in the ventricles. The arachnoid itself was thickened, pulpy, and gelatinous. The upper and outer parts of both hemispheres were of a dirty yellowish colour, and the convolutions smaller and more depressed than usual. The brain substance was brittle in consistence; contrary to expectation no emboli were found in any of the larger cerebral vessels which, as also the carotids, were empty to an unusual degree; but large coagula occupied both the pulmonary arteries. The heart was in a state of fatty degeneration, and all its cavities were enlarged. The valves seemed healthy. On slitting open the aorta from behind, the aneurism was seen to spring from the front of the ascending part of the arch immediately above the semi-lunar valves, the aperture of communication with the vessel being circular in outline, and about three inches in diameter, and its circumference thickened, rounded, and prominent. The sac was filled partly by coagula of blood and partly by fibrinous masses. The coats of the aorta were found to be freely occupied by atheromatous deposit and osseous plates."

Dr. Jennings remarked that the connexion which undoubtedly existed in this case, in the relation of cause and effect, between the aneurismal tumour and deranged cerebral nutrition, evidenced as the latter state was by partial or temporary paralysis, by the various phases of aphasia, by diotcy or mania, from all of which this patient had suffered at various periods of his illness, was a subject of the very deepest interest, and that it was a fair question for consideration, whether brain softening or extra-

vasation (whether sanguineous or serous) was not too generally regarded as the only sources of local lesion of nervous power and impairment of the intellect, when they might be produced in reality by far different and remote causes inducing an arrest, or decrease of arterial supply in the larger or perhaps in capillary vessels of the brain. Had there not been in the present case a pulsating external tumour, the character of which was unmistakable, few, if any, would have attributed these physical signs to their proper cause. He also considered that the absence of the ordinary evidences of thoracic aneurism, as enumerated in medical works, as likewise of those to which attention has lately been drawn by Dr. William Moore in his article "on the Diagnosis of Thoracic Aneurism," such as dulness of one side, facial lividity, inequality of the respiratory murmur and expansion of the opposite sides of the chest, the alterations produced in the pupils, the appearance of cuticular eruptions, difference in the temperature of the ears, paralysis of particular facial muscles, was fully counterbalanced by the second centre of pulsation, and those rare physical signs observed in the case just recorded.

Encysted Hydrocele from the Inguinal Canal of a Female.—Dr. Bennett showed an example of encysted hydrocele taken from the inguinal canal of a female. He found the specimen in the course of a *post mortem* examination of the body of a woman who died of chronic renal disease in Sir Patrick Dun's Hospital a few days previously.

The cyst extended from the external abdominal ring to the internal, and could be pressed into the abdomen some little way; it lay directly in contact with the round ligament of the uterus, and was inseparably connected at its internal extremity with the peritoneum. From these facts he was justified in concluding that it was formed by accumulation of fluid in an imperfectly obliterated canal of Nuck, in the same way as the hydrocele of the spermatic chord in the male was formed. The fluid was a clear serum of the ordinary character. He exhibited the specimen, as he thought it of interest in comparing the diseases of the corresponding parts of the male and female.—*March* 14, 1868.

Large Hydatid Tumour in the Abdomen.—Mr. Hamilton said that the subject of this case was admitted into the Richmond Hospital with a large tumour in the abdomen. A swelling occupying the left side was quite obvious to the sight. It was prominent, and presented a remarkable contrast to the right side of the abdomen, which was emaciated and sunken. On examination the tumour was found to extend from the ribs down to about a hand's breadth from Poupart's ligament. It extended on the opposite side to a little beyond the umbilicus, and behind to four or five inches from the spine, encroaching on the left kidney. The tumour was smooth on the surface, and of an oval form, elastic and fluctuating,

the presence of fluid being very distinct. The hand could not be passed between the upper part of the tumour and the spleen, which appeared continuous with the tumour, and there was dulness on percussion about four or five inches above the lower margin of the ribs, showing that the upper part of the tumour occupied the situation of the spleen. We had, therefore, a somewhat elastic, fluctuating tumour, evidently containing fluid, occupying a large portion of the left side of the abdomen, and probably springing from the spleen, or intimately connected with that organ. To discover how far the tumour was fixed, I turned the patient on his right side, and found that the tumour continued immovable. When he sat up, it kept its position, and was clearly fixed by extensive adhesions. I should have had no hesitation, under the circumstances, in puncturing the tumour and letting out the fluid, but the state of the man's general health was such as to forbid any operative treatment—his health was completely broken down, he laboured under cough, hemoptysis, profuse sweating, with rapid pulse. Although there were no local physical signs of phthisis, yet it was sufficiently clear from the symptoms that there were tubercles in the lungs. Extensive sibilant râles were the only auscultatory phenomena. He had, occasionally, attacks of delirium. He would answer questions reasonably; but when left alone, he would ramble, and be inclined to get out of bed, not unlike a person in *delirium tremens*. He vomited every thing he took. His only craving was for whiskey, of which he had been a large drinker for a considerable time previously. He was, therefore, not a subject upon whom to perform any operation—it would only hasten his death, and could give very little relief. Strange to say, this large tumour gave very little uneasiness. There was one place at the lower part where it was tender on pressure; but, if left alone, he suffered very little annoyance from it. There was one symptom which distressed him greatly—namely, an almost incessant desire to pass water, every hour at least. The urine was not unhealthy. It was examined by the resident pupil, Mr. O'Farrell, and he found no albumen in it, or any deposit. Very recently, I saw a case in consultation, in which a gentleman had a very large tumour in the left side of the abdomen, which was clearly malignant, large, nodulated, and solid. But in his case the most distressing symptom was an almost incessant desire to pass water. Every half hour he had a desire to do so, and he would scarcely have fallen asleep when he would awake, and be obliged to get up again. I have no doubt it was the pressure of the tumour irritating the kidney which caused this most distressing symptom. After being in the hospital about ten days, the patient whose case I now bring before the notice of the Society, died. On opening the abdomen the following appearances presented themselves. The tumour was adherent in front to the omentum and the walls of the abdomen; it was adherent to the diaphragm and to the large end of the

stomach, and also to the liver by close adhesions, which had to be broken up to exhibit the entire of the tumour. Below it was adherent to the colon. But it was not adherent to the kidney; but it rested on that organ, and had flattened it by its pressure. Now, with regard to the spleen. The question was how far it arose from the spleen, or was connected with disease of that organ. At the upper part of the spleen, by using a little force, the adhesions to the tumour were, to a certain degree, broken up; but, after that, any attempt to separate the spleen from the tumour only ruptured the spleen. In fact the spleen had become, as it were, amalgamated with the tumour. The wall of the tumour is strong and thick; but in some parts it is diaphanous, showing the fluid within. The difficulty is to prove where the disease originated—whether it was connected from the first with the spleen, springing from a hydatid cyst in it, or had its origin independent of it, but, having grown up in that situation, became adherent to it. There was one feature worth noticing, that the most tender portion was below, where we find the adhesions with the colon; rendering it most probable that, if this man had lived for some time, the cyst would have broken into the colon, and its contents passed off, and a cure, other circumstances permitting, in that way effected. The diagnosis made was that the tumour contained fluid, and that, possibly, it might prove to be a chronic abscess of the spleen. I have seen abscesses of the spleen—not often, for it is a very rare form of disease—and it reminded me of them. At the same time I said it would be utterly impossible to make a certain diagnosis in a case of the kind. Mr. Hamilton then opened the tumour, and out gushed a clear fluid like water, containing an immense number of hydatids, varying in size from a pea to an apple, perfectly round and transparent, the larger ones looking like soap bubbles. A section of the spleen and upper part of the cyst showed the latter to be unconnected with the interior of the spleen, but firmly united to it by thick adhesions. The substance of the spleen was soft, and easily broken up into a pulp, rather paler than usual; the liver hard and contracted, the kidnies affected with Bright's disease, and the lungs throughout contained tubercles. The case, therefore, presents us with a remarkable instance of an unusually large cyst, full of acephalocystic hydatids, and exemplifies the observation of Tyson, made near 200 years ago, that hydatids are most frequently met with in serous cavities, and in persons of broken down constitution.—*March* 28.

PROCEEDINGS OF THE DUBLIN OBSTETRICAL SOCIETY.[a]

THIRTIETH ANNUAL SESSION.

Dr. Hardy, President.

Hydatoid Ovum.—Dr. J. Guinness Beatty exhibited a mass of hydatids which were discharged by M. F., aged forty, who has had three living children and three miscarriages. Her last child was born the 26th July, 1866, and this she nursed till 1867, or just seventeen months, during which period she felt herself quite well in health, but her menses returned regularly in March (after nursing eight months); they ceased *suddenly* about last December; but in February a change came which lasted only seven days, but returned again in a fortnight, and have continued, almost without interruption, up to the present moment.

She was admitted into the Rotundo Lying-in Hospital on Monday, the 11th inst., greatly swelled, and her stomach exceedingly hard. All that night she was very ill, and had great loss, till about four o'clock, a.m., the mass of hydatids passed, and now she only complains of great weakness and loss of appetite. During the aforementioned period she has always lived with her husband.—*May* 9, 1868.

Case of Enormous Fibro-Cellular Tumour of the Vagina removed by Operation—Recovery. By Thos. Edward Beatty, M.D., M.R.I.A., Honorary Fellow of the Obstetrical Society of London, &c., &c.—While fibrous tumours of the uterus are abundant, such excrescences from the walls of the vagina are rare. Many writers of eminence who have treated of female diseases make no mention of them in their works. In searching the treatises of Ashwell, Gooch, Becquerell, Simpson, Baker-Brown, and Bernitz and Goupil, I find no allusion to fibrous tumours in this situation. Others, as Bouvin and Duges, Scanzoni, M'Clintock, and Graily Hewitt, take notice of such affections, and give accounts of some remarkable cases. Dr. M'Clintock says:—"Our knowledge of these tumours is at best fragmentary and imperfect, and the recorded examples of them extremely limited in number" (p. 197). And again, at a subsequent page, he remarks:—"As showing the rarity of these fibrous tumours of the vagina I may mention that Dr. West only met with one example. Dr. R. Lee states that no case of fibrous tumour or fibrous polypus of the vagina had ever come under his observation; and Dr. Churchill only records one instance at all analogous to the description of growth now under consideration" (p. 200). Although cases of this disease are rare, the diagnosis is not difficult when the tumours are

[a] These Reports are furnished by Dr. Geo. H. Kidd, Secretary to the Society.

of moderate size, such as those recorded by Dr. M'Clintock and Scanzoni. In his observations on this disease, Dr. Graily Hewitt remarks:— "These growths are not common: they occur of various sizes, and of different degrees of density. Thus there is the fibrous polypus of the vagina resembling the fibrous polypus of the uterus in its hardness and general shape; there is also a form of polypus described by Scanzoni, the mucous polypus of the vagina. Both of these tumours are easily recognized by the finger introduced into the vagina. The fibrous polypus of the vagina may be so large as to project externally, dragging the vaginal wall down with it" (p. 194, 1st ed.) This is what occurred in one of Dr. M'Clintock's cases, of which he has given a representation. But the tumour may be so large as to prevent us reaching the pedicle, and thus materially obscure the diagnosis. Of this the following is a remarkable case:—

Anne Murtagh, aged forty-two years, mother of several children, was brought to me by Dr. MacEvoy, of Balbriggan, and admitted into the City of Dublin Hospital on the 24th of August, 1867. She was worn and emaciated to a great degree, and was scarcely able to walk from excessive debility. This condition had been increasing for some months, and was owing to a very severe and almost constant hemorrhage from the vagina. On making examination with the finger it was at once arrested, on entering the vulva, by a large, firm, fleshy tumour, with a peculiar doughy feel. The finger passed freely round as high as could be reached, but no pedicle or connexion with any part could be detected. The next day Dr. Kidd saw her with me, and with a view to a more complete examination of the case I got the patient under the influence of chloroform. I now passed my entire hand into the vagina, and even then found it impossible to trace the connexions of the tumour, it was so very large, and so completely filled the vagina. Dr. Kidd was not more successful than I was in his attempt to reach the neck of the tumour. It therefore remained a matter of doubt from what part this enormous mass arose. It was plain to us that the only chance of saving the woman's life was the immediate removal of the tumour. Excision was out of the question, for in the first place I could not tell the nature and extent of the attachment, and in the next, if I had full knowledge of it, it would have been impossible to reach it. For the same reasons the ecraseur was inappropriate. I therefore determined to attempt its removal by the ligature. After a very long time spent in passing the ligature by Gooch's double cannula, I encircled the tumour as high as I could, and strangulated it. The ligature was tightened every day, and on the eighth day the instrument came away, having cut through all that had been included in the noose. The tumour was now a mass of dead material, but so firmly grasped in the vagina that it was impossible to extract it at the time. A wash of Condy's fluid was injected into the

vagina by means of a strong syringe; and on the next day, when prepared to extract the mass by force, I found it had been expelled in the course of the night. On examining the vagina with a large speculum, it was found that the tumour had grown from the upper and left side of the vagina, a new wound about the size of a half crown piece marking the place of its attachment. The patient was sustained with wine and nourishment. All hemorrhage ceased from the time the ligature was applied, and she made a slow but steady recovery, and left the hospital well in three weeks afterwards. I now exhibit the tumour. It is more of the nature of fibro-cellular than pure fibrous tissue. I regret I did not weigh it when removed. It has been ever since preserved in a strong solution of carbolic acid. Tumours of large size, such as this, have been removed. Dr. M'Clintock alludes to one by Kiwisch that weighed ten pounds, and one by Mr. Paget that had a diameter of five inches. M. Baudier removed one weighing ten and a-half pounds. Such cases are very rare, and I never meet with one so large as that now exhibited.—*April* 11, 1868.

Mr. Harley *read a Case of Gonorrheal Rheumatism occurring after parturition* :—On the 23rd of August, 1867, J. F., a servant man, of about forty years of age, of a fair complexion and strumous appearance, came to me to be treated for gonorrhea. It was a tedious case, as the discharge returned again and again after disappearing for some days.

He was a married man, and his wife was at this time in the country. She came up to town about the first of October, and very soon after called on me to say that she expected to be confined in a month, and to ask me to attend her. At this time her husband was occasionally suffering from a return of the discharge.

On the 28th of October she was delivered of a healthy female child. She suffered a great deal during the labour from what she called extreme soreness of the parts, such as she had never undergone in any previous confinement; this was the fourth child. She kept up a constant and horrible screaming all through her labour; such screams as we usually only hear when the last pain or two expels the head.

October the 29th, the day after she was confined, my attention was called to an inflammation of the child's eyes, accompanied with a purulent discharge. I directed that they should be well bathed with milk and water, and a light poultice of bread and water applied. The following day the discharge was much more plentiful, and, from its character, was distinctly gonorrheal. I applied at once a solution of nitrate of silver, four grains to the ounce, and continued to do so daily, and sometimes twice daily. This discharge continued from the eyes with great virulence for about a month, and for some time there seemed to be no chance of preserving the sight. The pupil of either eye could only be seen by holding the eyelids forcibly

open, and sponging away the thick matter. After about a month it began again to abate, and on the 6th of December the eyes were quite well and healthy. The treatment employed throughout was the nitrate of silver solution, except once I tried sulphate of zinc with manifest disadvantage. It was also kept on weak syrup of bark the entire time.

On the 30th of October, two days after her confinement, the mother was seized with a very violent attack of acute rheumatism in the left instep, left wrist, and back of hand, and on the shoulder and muscles of the neck of the same side. She was put on a mixture of carbonate of magnesia and bicarbonate of potass, with tincture of hyosciamus, and occasionally, when pain was very violent, anodyne draughts. After a few days the pain and inflammation were entirely confined to the wrist and instep, being particularly seated in the ligaments and fibrous tissues of the back of the hand and dorsum of the foot. After a few days more it was entirely confined to the wrist and hand, and had left the foot. The joint was kept supported and bound up in cotton wadding, and constantly stuped with a decoction of poppy heads containing an ounce of carbonate of potass to the pint. On the 3rd of November her mistress's family physician (Dr. Little) saw her with me, as well as the child, and from our interrogations then we ascertained that she had had a profuse discharge for some time before her confinement; also, unusual swelling of the labia, enlargements in each groin, great pain passing water, and an almost impossibility of walking. Her husband now confessed to me what he had before denied—that he had had frequent intercourse with her between the time she came from the country and her confinement, and it was only after her confinement that he got quite well himself. The wrist and hand remained for a long time much affected. She was, shortly after Dr. Little saw her, put on bark and iodide of potassium by his advice, and kept on it for more than four weeks. She gradually but very slowly improved, and about six weeks after her labour was able to leave her bed and attend to herself.

Even now, at this date, there is considerable stiffness and contraction of the joint, and especially when she first begins to use it in the morning, but after stuping it in hot water, and after using a liniment composed of chloroform, camphorated oil and laudanum, it becomes less stiff and painful.

I entirely abstain from putting forward any theory upon the above case; but I think it is not devoid of interest, including, as it does, simple gonorrhea, gonorrheal rheumatism, and gonorrheal ophthalmia, in three different people, who, though distinctly different in person, were so intimately connected, both by position and circumstances, and, in this case, unfortunately, by disease. Another fact which, I consider, makes the case interesting is, that this rheumatism, occurring in the puerperal stage, was undoubtedly gonorrheal, and very tedious of cure.—*April* 11, 1868.

TRANSACTIONS OF THE COUNTY AND CITY OF CORK MEDICAL AND SURGICAL SOCIETY.*

SESSION 1867-68.

DR. JOHNSTON, *President*, in the Chair.

A Case of Paraplegia Successfully Treated by Ice to the Spine. By E. R. TOWNSEND, jun., M.D., T.C.D., L.K.&Q.C.P.I. Read 12th February, 1868.

JOHN N., aged thirty-two, a shopkeeper in Kanturk, was admitted into the South Infirmary and County Cork General Hospital, January 27th, 1866, under the care of Dr. E. R. Townsend.

History.—About five months before admission into hospital, having been engaged in hay-making under a very hot sun, and whilst perspiring freely, lay down to rest on the damp ground, and got chilled. Towards evening he got rigors, and suffered from pain in the back; a few days afterwards noticed that he had some weakness of the lower extremities. This became rapidly worse, until he became completely paraplegic. The pain in the back became very severe, being much increased by pressure over the sacrum; also had pain in the legs shooting upwards, increased by motion. For this he was leeched and blistered, without much benefit. He thinks he also got ergot of rye; but not feeling better, he came to Cork, and was admitted into hospital, January 27th, 1866.

Symptoms on Admission.—Complete paralysis of motion over lower half of the body; has full power over the bladder; urine acid and healthy in appearance; bowels confined, not acting without medicine; temperature of body normal, with a great tendency to perspiration. He says that at one time the pain in his back extended to the dorsal region, and that his arms were slightly paralysed. He also had great difficulty in swallowing. This he still occasionally suffers from, accompanied by a choking sensation in the throat. On applying a pair of compasses to the legs he cannot feel the points as two at a less distance than six inches apart; reflex motion much affected; feels tickling the sole of left foot more than that of the right; the toes of left foot move slightly under the stimulus; those of the right do not stir, though he feels a disagreeable sensation when tickled. He never had any sensation of formication in the legs, nor any sensation as if a cord were tied round his waist, and did not show any tendency to the formation of bed sores. From the history of this case, as well as from the symptoms which he presented on his admission into hospital, I came to the conclusion that it was one of inflammation of the membranes of the spinal cord, probably with exudation of lymph on

* These reports are supplied by Dr. Purcell, Secretary to the Society.

them, and that the cord itself was not engaged, and ventured to hope that the patient might ultimately recover some power over his lower extremities from the length of time (five months) that he had been paralysed. It was evident that the time for very active treatment had gone by, and that as the affection had become somewhat chronic, we could only expect any improvement to be very gradual. I commenced treating him January 27th, by giving every night a pill containing four grains of aloes and one of capsicum to regulate his bowels, which were very obstinately confined. As he complained of pain over the sacral region, I ordered six leeches to be applied, to be followed by the cupping glasses, and to take one ounce of the following mixture three times in the day:—

℞ Extracti ergotæ liquid. Ph. Brit., ℈ij.
Potassii. iodidi, ℈ijss.
Infusi gentianæ, ℥x.
Syrup. Simp., ℥ss.
Fiat mistura.

To have full diet and a bottle of porter every day.

January 29.—The leeching and cupping somewhat relieved the pain. To continue his mixture.

February 2.—To be dry cupped over the sacrum.

February 4.—Bowels were yesterday affected without the pill or other aperient medicine, being the first time for the last three months that they had acted without it; reflex action slightly improved.

February 6.—Tenderness still continues along the back, over the upper part of the sacrum. To be dry cupped every second day.

February 15.—Complains of feeling much stiffer in the morning, upon first getting out of bed, than when he has been up for some time; reflex action improved; feels tickling the soles more than at first; when in bed can now draw up his left leg so as to bend the knee, but cannot stretch it down again; to have a hot and cold douche along the spine night and morning.

February 19.—Bowels slightly confined; to take a dinner pill containing aloes; to be dry cupped again along the spine.

February 20.—Can bear pressure better along the spine; there is one spot still tender; complains of sore throat, and has some difficulty in swallowing; omit douche.

February 24.—To be dry cupped every day.

March 6.—To have a pill containing one quarter of a grain of extract of belladonna twice a day; to continue his mixture and the dry cupping.

March 8.—Electricity to be applied to the lower extremities every day, and along the spine, with the magnetic electric machine.

March 12.—Feels more power over his legs; can now draw up both legs slightly.

March 16.—Progressing favourably.

March 20.—To take half a grain of extract of belladonna in each pill, and to have a large belladonna plaster, spread on leather, applied along the spine. He can now draw up both legs in the bed, and can raise the left heel a little off the bed; reflex power improved, but still very deficient; but as he is gradually loosing his appetite, he thinks change of air to his own home for a while might serve him. He accordingly left the hospital on March 21st, promising to take his medicines regularly whilst at home, and to take car exercise every day.

August 15, 1866.—Patient was re-admitted. He states that he has steadily persevered with the above treatment. Since he left hospital has been constantly taking exercise on a car, taking long drives about the country; that he feels more power over his lower extremities, and that his bowels, which were constantly irregular whilst in hospital, are quite regular now, not requiring any aperient medicine; appetite good; also the pain in his head and back are much less.

Symptoms on Re-admission.—Nearly complete paralysis of motion in right leg, with atrophy of muscles of the calf; reflex action much impaired; two points of a pair of compasses cannot be felt as such in the longitudinal direction at a less distance than three inches; has a good deal of power in left leg, being able to raise it about a foot and a half off the bed. When lying down he feels two points as two at a distance of one inch; urine acid; appetite indifferent; has very slight pain and tenderness on strong pressure over lumbar and sacral regions, and particularly at a point corresponding to the fourth lumbar vertebra; has some dysphagia occasionally, having now taken ergot and iodide of potassium steadily for nearly seven months, and having improved up to a certain point, where he remained stationary, I concluded that the chronic meningitis had been subdued, but that the nerves, having been so long pressed on in the narrow canals by which they pass out of the spinal cavity, were in the same state as the nerves in the axillary plexus in cases of long continued pressure against a chair, which we sometimes see giving rise to a local form of paralysis of the arm without actual nervous lesion, and which requires a powerful stimulus to the nervous centres to enable them to pass a current of nervous influence through the nerves so pressed on. I therefore determined to try the alternate effects of heat and cold applied along the spine by means of ice, and hot water as recommended by Dr. Chapman, for the purpose of increasing the vitality of the spinal cord. Accordingly, on August 17th, I ordered that pounded ice, mixed with common salt, should be applied along the spine for half an hour in one of Chapman's spinal ice bags, and on this being removed, that the hot water bag be applied for same space of time.

August 18.—Ice and hot water to be applied for three quarters of an hour, as he felt no inconvenience from the first application.

August 19.—Ice and hot water bag for one hour.

August 21.—This was increased to one hour and a half.

August 22.—Ice to be applied for two hours; hot water bag for one hour; electricity to be applied every day; to take half a teaspoonful of tinctura quina aurantii three times in the day in water, as his appetite was failing.

August 24.—States that he feels much more power over his lower extremities, and his appetite is improving.

August 25.—Ice could not be procured to-day, so I applied Richardson's ether spray along the spine for fifteen minutes, followed by the hot water bag, to be applied for an hour.

August 26.—Patient states that the ether-spray did not produce a greater degree of cold than the ice-bag, and found himself in no way better after its use. Whilst using it I found the back quite as sensitive to pressure over the tender part of the spine as previously.

August 27.—Ice and hot-water to be used as before; he continued this plan of treatment steadily, gradually increasing the time of application of the ice-bag until he could easily bear it on for three hours, and says he could bear it for five or six if necessary. He has been constantly improving since August 17th, when he first commenced the ice treatment.

September 10.—Improving very much the last few days, being now able to stand, for about 30 seconds, on both legs without assistance; the right leg is stronger in a marked degree, the patient being now able, as he lays in bed, to raise the entire limb fully two feet off the bed; can stir the toes quite well of the left, but not of the right foot—yet, does not complain nearly so much of the tenderness on pressure over the back.

September 17.—Patient is able to stand for nearly two minutes; marked improvement in all other symptoms.

September 24.—Exercises himself, supported between two men, and walks nearly half the length of the long ward without stopping. On first standing up feels pain and stiffness in the back, which gradually wears off as he walks; he perspires freely from the exertion.

September 30.—Complains of dull pain over the kidneys, and a burning sensation in passing urine, which is rather high coloured, but of normal reaction; ordered to drink kali-water, and to be dry cupped over the loins.

October 9.—Pain in kidneys relieved; has no pain in passing water, which is acid; to resume his ice and hot-water treatment.

October 14.—Patient is now able to walk the entire length (140 feet) of the ward with crutches, without any assistance; he raises the left leg with perfect ease and lays it firmly on the ground, but has a slight drag in the right; he spends his day exercising himself about the ward.

October 21.—Is now able to lay the right leg more firmly on the ground, and can now walk with the aid of two sticks; the reflex action

which was almost lost in right leg is now nearly perfect, the limb jerking about when the sole is tickled, and the toes sensitive to the least touch.

November 5.—He is now able to walk for a short distance without sticks, but his feet come to the ground with a spasmodic jerk.

November 15.—Is able to walk much more firmly without sticks, but says it requires great exertion on his part, his back feels so weak, though the tenderness and pain on pressure has almost disappeared.

December 21.—Ice to be discontinued; he is so much better.

January 2.—Left the hospital of his own accord, feeling almost well, and wishing to resume his business which he had been unable to attend to for a year and a half. Exact state on leaving hospital, is able to walk a hundred yards without sticks; on placing the right leg on a chair he is able to support the weight of his body on the left, but cannot do the same with the right leg yet, he can walk very well with a stick. This man called at my house last August to let me see the improvement in his state. He says he can walk several miles without fatigue, and has no jerk or drag in his gait, but cannot walk very fast; he can stand on either foot and raise the other without support; he can stand any length of time by having one hand or even one finger resting against some fixed support, such as a table or the counter of his shop, but would totter if not touching something when standing still; he can ride nearly as well as ever; his muscles are firm and well nourished, the right calf, which had been so wasted, is as plump and firm as it ever was, and his weight is the same as before his illness.

The improvement in this case was very gradual, and from the day he began to amend, it went on steadily. From the first this man was taken out of bed every day, and his position changed as often as possible, to lessen spinal congestion, and also to relieve the back from pressure, and thereby prevent stripping. From the day the ice treatment was adopted he began to improve, and during the entire time, over four months, that he was using it he took no medicine, except a little tincture of quinine to give him an appetite. That the favourable result of this case was due to the effects of the ice treatment, I think admits of no doubt.

Dr. Chapman, in speaking of this plan of controlling the circulation, and acting thereby on the sympathetic and cerebro-spinal systems, says: "I have discovered that a controlling power over the circulation of the blood in the brain, in the spinal cord, in the ganglia of the sympathetic nervous system, and through the agency of these nervous centres, also in every other organ of the body can be exercised by means of cold and heat applied to different parts of the back. In this manner the reflex excitability or excito-motor power of the spinal cord, and the contractile force of the arteries in all parts of the body can be immediately modified. In order to lessen the excito-motor power of the spinal cord only, he applies ice in an India-rubber bag along that part of the spinal column

containing the part of the cord which he wishes to act on. On the same principle, he says, the vitality of the spinal cord may be increased by applying hot-water and ice alternately if very energetic action be required; if less vigorous action be required, ice or iced-water only should be used, it may be repeated several times a day, with a long interval between each application, he then continues:—"If it be desirable to increase the circulation in any given part of the body, this I have found myself able to effect by exerting a soothing, sedative, depressing or paralysing influence (according to the amount of power required), over those ganglia of the sympathetic which send vaso-motor nerves to the part intended to be acted on. This influence may be exerted by applying ice to the central part of of the back, over a width of from four to four and a-half inches, and extending longitudinally over the particular segments of the sympathetic and of the spinal cord on which it is desired to act."

He also states that by applying ice to the back of the neck and between the scapulæ, he can direct a flow of blood to the brain; that the circulation in the thoracic and abdominal viscera can be influenced in like manner by applications to the dorsal and lumbar regions, &c. Now without going quite so far as this with Dr. Chapman, in his ideas of the effects of his discovery, as he terms it, I must say that I quite agree with him in considering it a valuable therapeutical agent, and one of great power when applied to suitable cases; and I certainly think that it is deserving of more extended trial, particularly in hospital practice, where the exact results can be more satisfactorily arrived at, than in private practice. I have several times applied ice followed by hot poultices to the nates and sacrum to prevent the formation of bed-sores, as recommended by Brown-Séquard, on much the same principles, and with very satisfactory results. I believe the application if resorted to in time, and before the skin is actually broken, will be found in almost all cases of paralysis, to prevent the formation of bed-sores; but this case is the first in which I have applied the ice-bag to the spine itself.

Selections from the Dutch Archives of Medical and Physical Science, Vol. iii., Parts I. and II. "Nederlandsch voor Archief Genees en Natuurkunde," Deel iii., 1e en 2e Afleveringen, Utrecht, 1867. Translated by William Daniel Moore, M.D., Dub. et Cantab., M.R.I.A., L.K.Q.C.P.I., Honorary Fellow of the Swedish Society of Physicians, of the Norwegian Medical Society, and of the Royal Medical Society of Copenhagen; Secretary for Sweden, Norway and Denmark, to the Epidemiological Society of London.

1.—*A Contribution to the Pathological Histology of Affections of the Intestinal Canal in the so-called Cattle Plague*, by A. Wirtz, Lecturer at

the Royal Veterinary School. In the course of last year Professor Koster applied to me for information on some points relating to the pathological anatomy of the then prevailing cattle plague, and for objects for particular investigation, especially parts of the intestinal canal. Our intention was to enter upon a more extensive histological examination. From various circumstances, chiefly connected with official duties, our intention was carried out only to a very limited extent. The literary and historical facts which I had already collected are little adapted for communication in this journal, but I thought it might be interesting to say a few words upon a single point: the histogenesis of the processes in the Peyerian and solitary follicles, according to the results of the investigation carried on in the anatomical museum here. For this opinion I had two reasons. 1. The fact that two authorities on the subject of veterinary pathology—Brauell[a] and Ravitsch[b]—differ entirely in opinion on this point. 2. The question whether the nature of the intestinal affection in the typhus of man does or does not agree with that in the cattle plague.

Brauell thinks that the local process in the intestinal mucous membrane consists chiefly, in addition to fatty degeneration and exfoliation of the epithelium, in a new formation, increase of the cellular layer of the mucous glands, the product of which also passes more or less rapidly into fatty metamorphosis. Meanwhile this is, however, also discharged from the glandular openings, and then forms on the surface of the mucous membrane, the, in proportion to the progress of the degenerative process, softer and softer matter, which is so often incorrectly described as exudation.

Ravitsch, on the other hand, infers, from extensive investigation that the mucous glands are not the principal seat of the disturbances. He points especially to the connective (follicular and adenoid) tissue of the mucous membrane as the starting-point of the changes. These consist in a proliferation of the corpuscles of connective tissue, and a more or less abundant production of small, round, lymphoid cells in the follicles of the intestinal wall, the mucous tissue surrounding the follicles, and in great part, also, in the sub-mucous connective tissue. The newly-formed elements break up more or less rapidly into a state of molecular detritus, with which a destruction of the mucous tissue is combined. This degeneration, both of the tissue elements and of the cells, occurs earlier and more extensively in proportion as the latter are accumulated in greater quantity, so that these are found also in extraordinary abundance in the places where loss of substance is already perceptible.

[a] *Neue Untersuchungen, betreffend die pathologische Anatomie der Rinderpest.* Dorpat, 1862.

[b] *Magazin für die gesammte Thierheilkunde* von Gurlt Hermy, Berlin, 1864, 30ter Band, 3ter Heft, pp. 313-56.

The Peyerian and solitary glands are, in the commencement of the disease, always swollen, and loaded with lymph cells, with which the interfollicular tissue also is so infiltrated that it can be recognized only by its fibrous fasciculi. Moreover, there exists everywhere a very intense proliferation of the connective tissue corpuscles, particularly evident in the sub-mucous membrane, and between the glands of Lieberkühn. At a later period of the disease the follicles are in great part, especially in their centre, filled with yellow molecular mass, and burst in their arched portion. The contents which have partly escaped then form larger or smaller, firm or partly softened yellowish white laminæ of varying thickness. Some follicles are also of a deep red colour, and are covered with extravasations or dark red crusts. The degeneration of the follicular tissue spreads, moreover, towards the circumference, so that after removal of the lamina or crusts, the areolated gland remains with rough, corroded follicular walls, or, more rarely, with great loss of substance in the form of ulcers. The affection of the tubular glands is secondary, and proportionate to the intensity of the process described; the glands are either still present, or, in consequence of the alterations in the surrounding tissue, are more or less destroyed, and are finally wholly changed into a molecular mass.

The microscopical examination, in the anatomical museum here, of solitary and Peyerian glands, where the process had just begun, entirely confirmed the correctness of Ravitsch's views. Swollen parts were met with where the mucous membrane still completely traversed the surface, and distinctly exhibited the as yet unaltered glands of Lieberkühn; while beneath the same, and between the bases of the glands, a swollen mass of connective tissue, infiltrated with lymphoid cells (adenoid tissue), was found. If the process be somewhat farther advanced, so that in the centre of the augmented mass the first traces of destruction and formation of detritus are apparent, the mucous membrane, also, is abnormal, scarcely exhibiting the glandular layer, and is soon drawn into the process of infiltration and destruction, so that either an opening occurs through which the mass of detritus is discharged from beneath, or larger pieces of the mucous membrane are thrown off as a dead mass with the subjacent layer.

In a histologico-pathological point of view we might, therefore, place the intestinal affections in the so-called cattle plague, and in the typhus of man in one line. It would, however, be at least very venturesome, merely on the ground of this analogy, to express a positive opinion with respect to them.

II.—*Fibroma at the Base of the Brain and along the roots of some Cerebral Nerves*, by W. Koster. In the middle of the month of August, 1867, I made in the hospital here the *post mortem* examination of a strongly-

built and powerfully muscular man, aged thirty-three, in whom, during life, the symptoms of a tumour in the brain were observed. Neither these symptoms, nor the history of the case in general, require any detailed description, as they presented no peculiarities worth mentioning. It is necessary to state only that during the last two months of the affection the man began to be deaf. The deafness increased so much that it was soon complete. This was a strong confirmation of the diagnosis which had already been made that the seat of the tumour was the posterior part of the base of the brain. There was no disturbance of vision. Occasionally the occurrence of cerebral hyperemia threatened to cause death, which finally took place without perceptible signs of paralysis of the medulla oblongata.

In the body no morbid changes were met with, except within the skull. Sanguineous congestion of the large and small vessels, dropsical distention of all the ventricles, especially of the third, and a considerable tumour at the under surface and anterior edge of the cerebellum, at once struck the eye. It is in fact the nature and extent of this tumour, which seemed to me to be deserving of a short communication. The tumour consisted, like the cerebellum, of two lateral portions, connected in the middle by a transverse piece, in front of the pons varolii. The swelling was greater on the left side, and projected in front of and above the hemisphere of the cerebellum of that side, forming, as it were, a second and smaller hemisphere. It was, however, firmly connected with the cerebral mass, as the whole tumour, having arisen beneath, *or, at least in*, the pia mater, had penetrated also, though not deeply, into the mass of the cerebellum. On the right the tumour projected less, formed, as it were, the anterior and inferior surface of the hemisphere of the cerebellum itself, the substance of which, as well as on the other side, was partially involved in the tumour. These particulars were of course not visible until the tentorium cerebelli had been removed. The centre piece of the tumour lay flat in front of the pons Varolii, and extended only along the clivus Blumenbachii, through the great opening of the tentorium, forwards to the tuber cinereum. The surface of the clivus (basilar process), and the dorsum ephipphii (sella turcica), were excavated by the pressure of the tumour, while, at the same time the cavity for the pituitary gland was thereby diminished, and the latter was itself atrophied. Posteriorly the lateral portions of the tumour had rounded edges, which lay on the depressions of the occipital bone, and had there produced some further excavation, and wear and tear of the bone. Anteriorly appendices of the tumour were continued along the origins of some nerves, especially along the nervus trigeminus, and along the auditory and facial nerves in the meatus auditorius internus. The nervus vagus and the glosso-pharyngeal were only pushed aside. On taking out the brain, when the tumour along the basilar process came into view, the

abducent nerve did not appear. Nor, after taking out the brain, could I recognize the origin of the nerve, as the middle piece of the tumour lay firmly pressed against the anterior part of the pons Varolii. I suspect that the nerve lay pushed forwards and upwards.

The tumour formed within the distended meatus auditorius internus a mass rounded at its extremity, whose surface was seen in the skull after the cavity of the tympanum was opened, so that the vestibule was quite pushed away. I should have been glad to have delineated more accurately the change of form of the other parts of the skull (a drawing of the tumour is given in the original), but the *post mortem* examination was made in secret, and the chiselled out petrous bone was all that I could obtain, and that not without difficulty. A more accurate investigation, *in situ*, of the continuation of the tumour along the nervus trigeminus and the Gasserian ganglion especially would have been of importance. The dura mater, which covers the so-called Meckel's cavity, was separated, and the pushed out and scarcely recognizable mass of the nerve and of the ganglion was contained in the increasing tumour, which was demonstrable as far as the superior orbital fissure.

When I began the closer examination of the parts of the tumour taken out, I thought I should again find a sarcoma, such as so often occurs in the cavity of the skull, and has formerly (*Nederlandsch Archief*, Deel i., p. 429), and subsequently repeatedly been observed by me. However, the knobby state of the surface, and the hardness of the tumour on the left side, had already attracted my attention. It seemed to me, on microscopical examination, that the tumour must be looked upon as a fibroid, or, rather (on account of its growth and extension), as a diffuse fibroma. The most freely projecting left part had quite the appearance, on section too, of one of those small fibrous tumours which are so frequently met with in the uterus. The softer parts of the tumour consisted, also, entirely of fibrous connective tissue, but with a considerable number of blood-vessels. On examining the parts of the tumour which had grown along the origins of the nerves, nerve tissue was, as might be expected, met with.

Only in some parts of the tumour was a tendency to cell formation visible. Thus, in place of the round or slightly elongated nuclei of the connective tissue, groups of large irregularly situated cells were seen, but so scattered and so little characteristic were these that I would not venture to call the tumour fibrous carcinoma.

Besides its situation and extent, the tumour is consequently distinguished also decidedly by its composition. Essentially fibrous formations are rare in the cerebral membranes and brain. Besides some cases scattered in literature, Förster mentions an observation of Rokitansky concerning a cavernous tumour of the pia mater, and a case by Thilenius:—"A fibroid of the size of a hen's egg in the pia mater; the

tumour was externally tuberculated and internally uniformly fibrous" (Förster, Handbuch, i., p. 604.)

While the cerebral tumours, particularly accurately studied by Virchow as sarcoma fusocellulare and gliosarcoma, form a peculiar group of neoplasmata of the nervous centres, in contrast to the fibromata (neuromata) of the peripheral nervous system, tumours such as that above described make the transition, so far as concerns their seat, evident. In this point of view, and in connexion with the increase of the fibroma described by me along the trigeminus and the auditory nerve, the words of Förster are remarkable:—"The neuromata occur mostly on the peripheral trunks of the spinal nerves, sometimes, also, on the cerebral nerves, *particularly on the auditory*."

III.—*A Salivary Calculus in the Whartonian Duct*, by A. Ilcken. In No. 54, 1866, of the *Wiener Wochenschrift*, the case is described as being remarkable, of a salivary calculus removed on the 20th February of that year, in the "Hôpital Lourcine," at Paris, from the Whartonian duct of a woman aged twenty-four. The greatest measurement of the calculus amounted to 1 centimetre.

From this communication I infer that the salivary calculus taken by me from the Whartonian duct, is still more remarkable than I at first thought. In fact, this calculus is $3\frac{1}{2}$ centimetres (1·3779″) in length and 1 centimetre in breadth. It weighs now, on the 2nd October, after having been freed from the adhering mucus and well dried, 2 scruples 1 grain.

The patient, a lady of seventy years, had only a short time before observed that there was something not right in her mouth. Her chief complaint was of the saltish taste of a fluid which bubbled up beneath her tongue. On the 13th of June she came to me. I found the whole right half of the floor of her mouth hard, and this hardness was perceptible, also, externally, on pressure behind the angle of the lower jaw. Close to the frenulum linguæ, on the right side, was an opening, the dilated orifice of the Whartonian duct, whence, on pressure on the floor of the mouth at that side, a yellowish thin fluid was discharged, which produced the saltish taste. A probe introduced into this opening immediately struck against a hard body. I dilated the opening with a button-pointed bistoury, and could then also see the point of the calculus, but my efforts at extraction were in vain. On the following visit, too, a couple of days later, I was obliged, after having divided the soft parts on the calculus with a strong Cooper's scissors to a tolerably great extent, to desist from the removal of the stone, chiefly on account of rather violent hemorrhage. On my third visit, however, after the lapse of two days more, the calculus came out with tolerable ease at the first pull.

It has the form of the Whartonian duct, and is, therefore, slightly curved. The part which was turned towards the frenulum is the thickest. The surface is rough, with the exception of a small portion at the outer end. In order to preserve it uninjured I have abstained from having it chemically examined. Such an examination would certainly have yielded no other result than that of other salivary calculi and of the calcareous salts, which, in some people, become deposited on the teeth (tartar). The patient is toothless, and had formerly a quantity of tartar on the teeth. The laminated structure of the calculus is visible at the inner extremity, from which, in the efforts at extraction with the forceps, pieces are chipped off.

A few days after the removal of the calculus this lady no longer found anything wrong with her mouth. The inflammatory hardness in the neighbourhood of the Whartonian duct and in the sub-maxillary gland speedily gave way.

IV.—*Fracture of the Os Calcis from strong contraction of the muscles of the calf of the leg*, by Dr. van der Lee, of Velp. The following history relates, in my opinion, to a surgical lesion too rare not to deserve a word of mention:—

On the evening of the 24th October, 1866, I was called to a woman aged sixty, who, having walked the short distance from Velp to Arnhem, in the latter place, going down a step, came with the left foot across the channel, and, at the same time, losing her balance, fell down. She attempted to get up, but found that she could not stand upon the left foot, and that the latter was very painful. A surgeon was called, who was obliged to cut off her shoe and stocking, and after applying a simple bandage, at her own request had her brought home.

On removing the bandage, no unusual condition of the leg and foot was observed. The patient complained of pain above the heel and in the ankle. In the former situation the following was observed:—About two fingers' breadth above the os calcis was a hard crescentic mass, which appeared to have been separated from the os calcis; the skin between this mass and the heelbone was drawn inwards, the epidermis in the place where the skin was strongly stretched by the same mass, was raised by effusions of blood, and was very painful.

All movements of the foot were possible when the leg was fixed in the usual mode, and the foot was moved with the other hand; there was, consequently, no luxation. Fracture, in the ordinary sense, was not demonstrable, as both the position of the foot was natural, and crepitation was entirely absent.

From all this we diagnosed: rupture of the tendo Achillis, with a piece of the os calcis attached.

The prognosis was so far unfavourable that complete union would be extremely doubtful, while the treatment must be directed to the object of

promoting union as far as possible. A firm bandage was, therefore, the first indication.

It appeared not advisable to apply a starch bandage on the first evening, as we feared that the skin could not bear the strong pressure. We determined, therefore, to apply a simple bandage, and to have it covered with compresses of cold water. On the following day the swelling was not diminished, nor did we even then think it well to use the starch bandage, as this would hinder us from observing the state of the skin, as often as might be necessary.

Union would be possible only if the os calcis were brought as close as might be to the extremity of the tendon; relaxation of the muscles of the calf was to this end as necessary as a good position of the foot. To effect all this we had an apparatus made consisting of three parts connected one to another by hinges.

We bound the lower leg and foot from above downwards in order to bring the tendon as much as possible towards the os calcis, and we placed the whole leg in the apparatus described in the position indicated in the figure. The under surface of the knee rests upon$^{\alpha}$, while β is made as obtuse as possible, whereby the heel is brought backwards and upwards, and the toes downwards.

The course and treatment of the case were in other respects tolerably simple. From time to time we renewed the bandage, and at length we thought we might try how far the patient had regained the use of her foot. In the beginning of January, 1867, she was so much improved as to be able to stand upon the left leg, though the support of a stick was indispensable to her. Between the os calcis and the tendon some intervening matter (ligamentous mass) had formed, which made it possible to bring the heelbone upwards, although this movement was not free. The hard mass was still plainly to be felt.

I refrain from further remarks upon this case, which I communicate only on account of the comparative rarity of the lesion. Although practitioners seem sometimes to have felt themselves called upon to adopt more energetic modes of treatment (Poncelet cut the tendo Achilles in order to approximate the pieces of the os calcis[a]), this case proves that good results may be obtained by ordinary simple management. As to the origin of the lesion I imagine that two causes have co-operated:—1. A force from without acting on the fragile bone (the woman was sixty years of age); and 2. The strong contraction of the muscles of the calf which takes place when a false step is made, and which, no doubt, must have been the principal element in the accident.

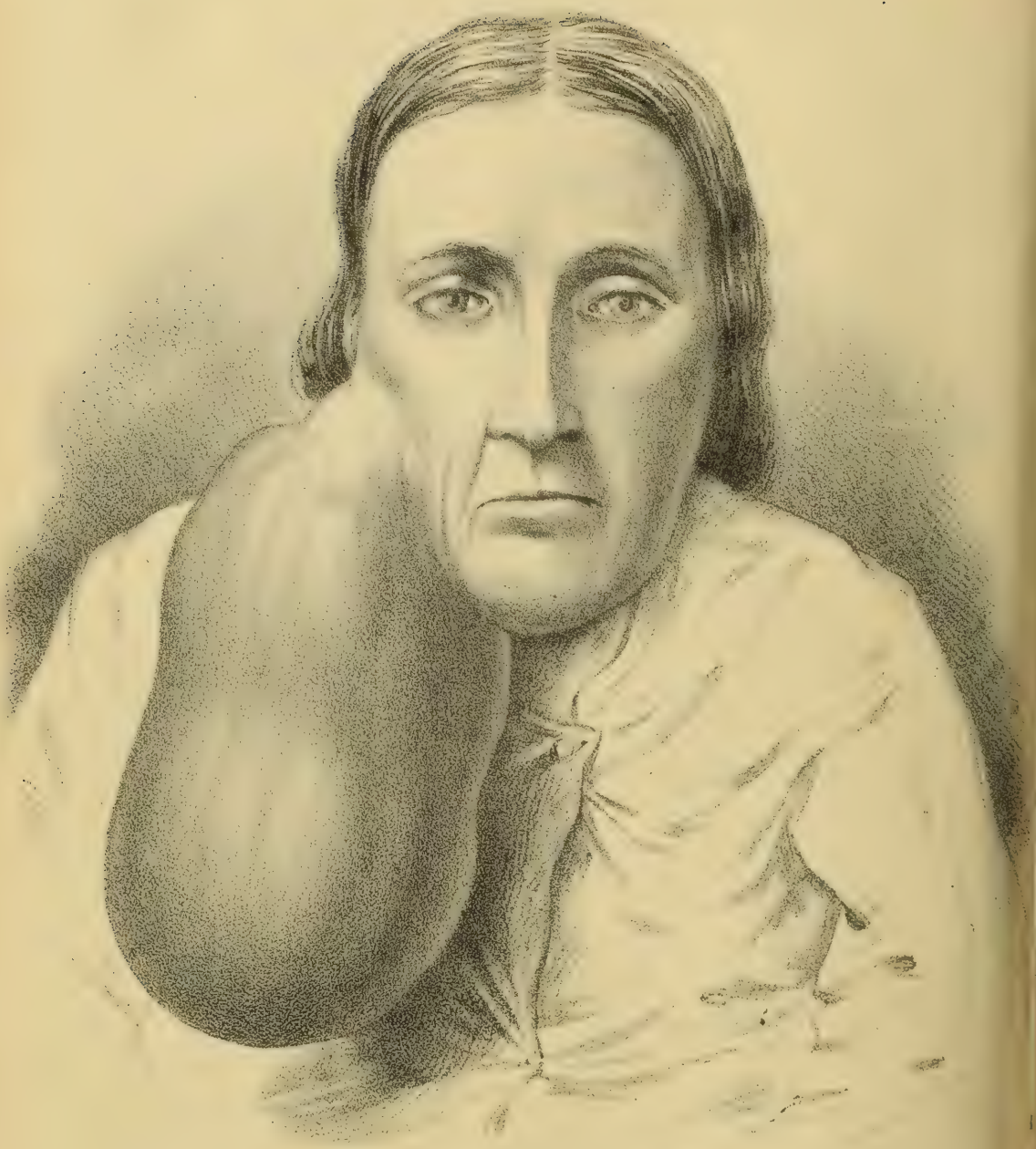
V.—*Origin of the Congenital Renal Cystoid*, by W. Koster. In the preceding volume of the *Nederlandsch Archief* I published an essay upon

[a] Emmert, Heelkunde, vert. door Polano D. iv., Afl. 3, blz. 232.

"Uric Acid Infarction and Renal Cystoid." On account of the difficulties there specified (pp. 179, *et seq.*) I thought that Virchow's opinion, that the congenital renal cystoid owed its origin to a "fetal inflammation of the renal papillæ," must be considered incorrect, and I gave another view of the course of such cases. It was to the effect, that the origin of the cystoid kidney was deduced from an *abnormal development*, a lesion of evolution, analogous to atresia ani, non-development of the urethra, abnormal development of the spinal canal, causing hydrocephalus, spina bifida, &c.

Although this view does not at once throw much more light upon the details of the development of the renal cystoid, it differs widely from Virchow's opinion; and it brings us a step nearer the truth if actual proofs of its correctness are discoverable. As such I could formerly mention only: the total absence of the renal calyces, the renal pelvis, and the ureters in many cases of congenital renal cystoid, and the want of special arguments in favour of the existence of fetal inflammation of the renal papillæ. This last is rather assumed as a postulate of the theory, which looks upon the renal cysts as "retention-cysts," than proved by facts.

The way to arrive at greater certainty lay evidently in the investigation of the development of the kidneys in the embryo. It is notorious that our knowledge of the details thereof is still very defective, and that the investigation is attended with extraordinary difficulty. While I was lately engaged with Heer J. G. van der Lith in researches upon the development of some parts of the internal genitals, with special reference to the descent of the testicles, upon which subject something will soon be published, I was anxious, also, to study the development of the kidneys. Meanwhile, Kupfer's essay on the development of the kidneys appeared in the "Archiv für mikroskopische Anatomie von Max Schultze, Bd. 1, Heft 2 und 3." From this it appeared that the *kidney proper*—that is, the blastema for the tubuli uriniferi—is developed by itself, independently of the evolution of the Wolffian duct, which becomes ureter and renal pelvis. If this fact be confirmed, the origin of cystoid kidneys is explained together with *total absence of renal pelvis and ureters*, while it would be incomprehensible if the renal tubes were formed as out-runners of the renal pelvis. Want of time and material prevented me from repeating and extending Kupfer's important investigation. I therefore thought that I might call attention to the applicability of the fact ascertained by K. to my views as to the origin of the cystoid kidneys. The question of the *how* of the abnormal development is not yet thus answered, it is only made evident *that* an abnormal development may occur, which places the kidney in process of formation under totally different conditions from those existing in ordinary cases, where there is connexion between it and the renal pelvis. Evidently an entirely different process takes place from that understood by *inflammation* of formed renal papillæ.



Mr CROLY ON OPERATIVE SURGERY.

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PART I.

ORIGINAL COMMUNICATIONS.

ART. X.—*Contributions to Operative Surgery* (*continued*). By HENRY GRAY CROLY, Fellow and Licentiate of the Royal College of Surgeons in Ireland; Licentiate of the King and Queen's College of Physicians; Surgeon to the City of Dublin Hospital; Lecturer on Clinical Surgery; Senior Demonstrator of Surgical and Descriptive Anatomy in the School of the Royal College of Surgeons, &c., &c.

Cases of Large Tumours Successfully Removed by Operation (*Illustrated*), *and a Report of Malignant Tumours Unfit for Operation.*

I.—ENORMOUS PENDULOUS TUMOUR (OF 14 YEARS' GROWTH), OCCUPYING THE RIGHT PAROTIDEAN SPACE AND SIDE OF THE NECK—EXCISION—COMPLETE RECOVERY, WITHOUT DEFORMITY.

II.—LARGE TUMOUR (OF 5 YEARS' GROWTH) SITUATED ON THE INSIDE OF THE RIGHT THIGH, SUCCESSFULLY REMOVED.

III.—LARGE FIBRO-CYSTIC TUMOUR (18 MONTHS' GROWTH) OF THE SCROTUM, INVOLVING THE RIGHT TESTIS—SUCCESSFULLY EXCISED.

IV.—TUMOUR, OF STRUMOUS ORIGIN, INVOLVING THE LEFT TESTIS—CASTRATION—RECOVERY.

V.—SERO-CYSTIC TUMOUR OF THE BREAST—AMPUTATION—RECOVERY.

THE following cases are examples of large tumours occupying

respectively the neck, thigh, scrotum, and breast; and, although not essentially malignant in their character, yet, owing to their enormous bulk, weight, and situation, were productive of serious discomfort, inconvenience, and deformity, demanding removal by surgical operation. Each tumour was situated in a region containing important blood-vessels, and other structures, requiring careful and cautious dissection in the removal. I also subjoin an account of several cases of other large tumours—cases in which, though urgently pressed upon by the patients and their friends, I was most unwillingly obliged to decline operative interference, the symptoms having presented features indicative of malignant disease of the worst form, and, therefore, entirely unsuited for operation.

The result of those cases proved the correctness of such practice.

CASE I.—*Enormous Pendulous Tumour (of 14 Years' Growth), occupying the Right Parotidean Space, and Side of the Neck—Excision—Complete Recovery, without Deformity.*

M. C., aged forty-six years, a laundress, unmarried, residing in the country, and whose general health had been always good, was admitted into the City of Dublin Hospital on the 10th of March, 1868, under my care.

History.—About fourteen years ago she noticed a small kernel in front of her right ear. The swelling gradually increased in size, and was three years growing before it became as large as an apple. It was movable under the fingers, and occasionally caused some pain, like the darting of needles. The tumour increased proportionately more within the last three years than previously to that period. She suffered considerable annoyance latterly from the hideous deformity and great weight of the tumour, rendering her unfit to appear in public, or earn her bread. She was obliged to support the swelling by means of a broad handkerchief made into a sling, which she tied over her head. She was for many years deterred from submitting to operation, fearing a fatal termination, until a few days before her admission into hospital, when the dependent part of the tumour suddenly gave way, and she lost a considerable amount of dark-coloured blood, which alarmed and debilitated her so much that she decided upon having the tumour removed.

Appearance of the Patient and Tumour on Admission into Hospital.—She presents a pale but otherwise healthy aspect, and has not any constitutional indication of malignant disease, the

pallor being referable to loss of blood. The tumour grows from the right parotidean space, is pendulous, and covers the side of the neck, presenting a most remarkable and huge swelling. Its shape is somewhat oblong, with slight hour-glass constriction; the integument covering the growth is of natural colour; superficial veins ramify on the surface. The lower end, from which the blood issued, is ulcerated. The surface is even, except at the upper and anterior part, where there are two tubercles about the size of marbles. The tumour is movable, firm, and very heavy, measuring eight inches in the long axis, and reaching down almost to the nipple of the breast; the circumference at the pedicle is twelve inches. A drawing of the patient, exhibiting the tumour, was made by Mr. Burnside, from which the accompanying lithograph was taken by Herr Tomsohn (Forster and Co.), and presents a faithful delineation of the case (*vide* Plate I., Fig. 1).

Treatment before Operation.—The tumour was placed resting upon moulded pasteboard, lined with wadding cotton, and suspended by a broad bandage from the curtain-rail surrounding the bed for the purpose of lessening the congestion of the diseased mass, and by diminishing the size of the blood-vessels, rendering the operation less hazardous, as well as adding to the comfort of the patient by taking off the weight of the tumour. The patient was ordered nourishing diet, having been daily supplied with brandy and egg beaten up, wine, strong beef essence, and mutton chop, with quinine and iron mixture, to restore her health, debilitated by the hemorrhage. At a consultation with my surgical colleagues it was unanimously decided that the tumour should be removed by operation, which I accordingly performed on the 25th of March, in the presence of the hospital staff and a large assemblage of hospital surgeons and students. The patient took a glass of brandy beaten up with two eggs in the morning, and a glass of brandy, previous to the inhalation of chloroform, which was administered in her bed, from which she was removed to the operation theatre, with the poles and sheet, and placed on the operating table. The common carotid artery, at the right side, was compressed by an assistant, and the tumour having been raised I commenced by making an elliptical incision through the integuments underneath the pedicle of the tumour, extending obliquely from the lobe of the ear towards the angle of the mouth. A second similar incision was then made across the anterior surface of the pedicle. The flaps of integument thus

formed (and of ample size to allow for retraction) were rapidly dissected from the tumour, which was then detached from its site by my fingers and the handle of the scalpel. The facial vessels, parotidean space and masseter muscle, were thereby exposed. I next proceeded to separate the diseased mass from under the jaw, and from behind the ear. During these steps of the operation very little blood was lost, but a sudden gush issued on dividing the deep-seated pedicle. Ten vessels required ligatures, fine hemp being used. The masseteric branch of the internal maxillary artery, which was of large size, bled profusely. I seized it with some fibres of the muscle in the artery forceps, and applied a short hemp ligature. The bleeding still continuing, I introduced under the vessel, and close to the lower maxilla, a long acupressure pin, and with a loop of inelastic iron-wire passed over its point, and fastened with a half-hitch around the head-end, I controlled the hemorrhage. The pin was placed in the long axis of the wound so as to permit of removal. The surface of the wound was next sponged with cold water, and then with carbolic acid oil (1 part to 5). The edges of the wound were approximated, and retained with six points of twisted suture (American pins being used). Strips of adhesive plaster were applied between the sutures, and a compress of lint was placed beneath the jaw, and retained by adhesive plaster, to support the lower flap.

The patient recovered from the anesthesia, and took some brandy and water. She was then removed to her bed, which was comfortably arranged, with a hot jar, and she was so thoroughly unconscious of the operation having been performed that she asked, "When will it be done?!!!" and was equally surprised and delighted on hearing that it *had* been performed.

5 o'clock, p.m.—Pulse 120; patient has slept since operation; stomach inclined to be sick; she took ice and whey.

10 o'clock, p.m.—Pulse 120; muscles of expression of right side partially palsied (caused by the unavoidable division of some branches of the portio dura nerve). Ordered 25 minims of solution of muriate of morphia in camphor julep.

March 26th (day after operation).—Patient had some sleep; pulse 100. Ordered chicken broth, brandy, and ice.

The patient progressed favourably from day to day. The acupressure pin was removed on the third day; not a drop of blood followed. A portion of the wound in the centre united by "the first intention," the remaining portions having granulated.

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Fig. 1. *Profile view after removal of Tumour.*
(From a Photograph.)



Fig. 2. *Front view after removal of Tumour.*
(From a Photograph.)

Forster & Co Lith. Dublin

The facial paralysis soon disappeared, and the patient made an excellent recovery, and within six weeks from the day of operation was discharged from the hospital, and returned home. Photographs have been taken by Lawrence, from which the accompanying lithographs (by Forster) were executed, showing the absence of any deformity, and in striking contrast with the hideous appearance before operation.—(Plate II., Figs. 1 and 2.)

A section of the diseased mass having been made after removal, it was found to present the usual characters of fibrous and fatty tissue. A microscopic examination confirmed the opinion expressed before operation—that the tumour was not malignant.

Case II.—*Large Tumour (of 5 Years' Growth), situated on the Inside of the Right Thigh, Successfully Removed.*

J. S., aged twenty-four years, a labourer, and a powerfully muscular man, residing in the county of Donegal, was admitted into the City of Dublin Hospital on the 29th of November, 1864, under my care.

History.—About five years previously he felt a small kernel, about the size of a hazel nut, on the inner and posterior part of his right thigh, near the central third of the limb; it was a hard, movable, subcutaneous, and painless swelling. He received no injury, and could not in any way account for the growth. During the first three years it increased very little in size, but for the past two years it has grown rapidly, and caused some pain, which continued for two or three days at a time. He did not seek medical advice until six months ago, when he became anxious in consequence of the daily enlargement of the tumour, which interfered with the free movements of his limb, and prevented him from working. He then sought the advice of my friend Dr. Welsh, of Ballyshannon, who recommended him to me.

Appearance of the Patient and Tumour on Admission.—Patient in robust health, and says he suffers little or no annoyance from the disease, except the inconvenience of its bulk. On examination a tumour, the size of a large cocoa nut, is observed, occupying the inner and posterior aspect of the thigh, projecting more backwards than forwards. It is uniform in shape, very movable in the long axis of the limb, but not so much so in the transverse direction; firm, yet elastic to the touch; one spot, the size of a penny, on the centre of the tumour is especially hard, feels like cartilage, and is the only part which is painful on pressure. The growth extends

into the upper part of the popliteal space. There are not any vessels ramifying on its surface. The femoral artery can be felt pulsating along the internal and anterior border of the tumour as far as its upper third, but not below that point. A beautiful cast of the patient's thigh and leg, showing the position of the tumour, is preserved in the museum of the Royal College of Surgeons. The tumour is $9\frac{1}{2}$ inches from above downwards, and $13\frac{1}{2}$ inches transversely (*vide* Plate III., Fig. 2). There is not any glandular contamination, and no œdema of the limb. On consultation with my colleagues it was decided that the tumour should be removed, and I accordingly operated on the 3rd of December in the following manner:—The patient having been placed on the operation table, and turned on his side so as to expose the internal and posterior portion of the tumour, a tourniquet was placed upon the femoral artery, but not tightened, in order to arrest hemorrhage, should it be found necessary. I commenced by making elliptical incisions in the long axis of the tumour, and removed a small portion of integument. I divided the fascia on a director, and soon reached the cyst, which presented a glistening appearance, with some muscular bands stretched across it. These having been divided, I used the handle of the knife towards the internal part to avoid the femoral vessels. With the use of my fingers I then rapidly surrounded the tumour, and completely detached it. The great sciatic nerve was seen in the bottom of the wound. A few muscular branches of arteries were ligatured, the cavity was filled with lint, and a roller bandage applied. The patient was carried to bed, and took some wine.

Evening visit.—There has been slight oozing from the wound, but not enough to justify the removal of the dressings. The patient looks well. Ordered 30 minims of the solution of muriate of morphia in camphor julep, to be taken if necessary to produce sleep.

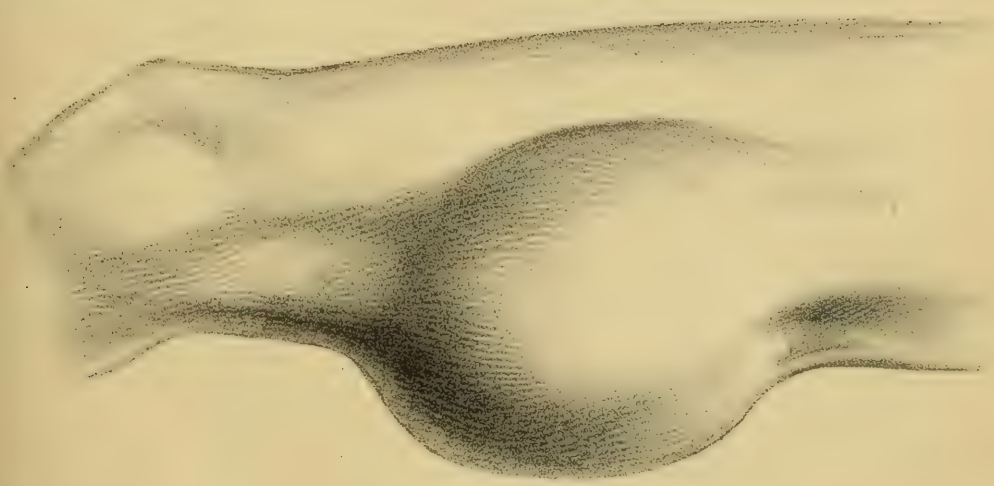
December 4th (day after operation).—Pulse 80. Patient slept well. Bandage and lint, stained with blood, which oozed from the cavity, were removed. Edges of the wound were approximated by means of six interrupted iron wire sutures. A large compress of lint was placed at either side of the wound, and supported by strips of adhesive plaster applied so as to give additional support. A roller bandage was next carefully applied from the toes, and carried to the upper part of the thigh.

December 5th.—Pulse 100. Patient slept some hours.

Fig 1.



Fig 2



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December 6th.—Patient does not feel so well to-day. His tongue is covered with a white fur. His skin is hot, and pulse quick. Bandage removed. Slight purulent discharge from the wound.

December 7th.—Wound suppurating freely. Sutures removed. Cavity washed out with water and solution of chloride of zinc. Warm water dressing applied. Patient taking wine, beef tea, and whey.

December 8th.—Pulse 88. Skin cool. Copious discharge of sanious pus from the wound.

It is not necessary to give the daily notes of this case. The patient made a good recovery, and the wound healed. He was discharged from hospital.

Tumour weighed 34½ ounces, and was invested in a strong fibrous capsule. On section a sero-sanguineous fluid escaped. The interior of the mass presented a number of cysts containing clotted blood, some being empty. One portion of the tumour presented a cerebriform appearance, and the hard part which was felt before operation cut like cartilage.

Case III.—*Large Cystic Tumour* (18 *Months' Growth*) *of the Scrotum, involving the Right Testis, Successfully Removed.*

A. L., aged nineteen years, groom to a nobleman in the King's County, was admitted under my care into the City of Dublin Hospital, on the 24th of October, 1863.

History.—Eighteen months previously he received a hurt in the right testis from the shoulder of a horse whilst exercising him. He took no notice of it for three weeks, when he observed a slight enlargement of the testis. It increased in size gradually, and soon became as large as an egg. He consulted a medical gentleman in the country, who prescribed cold lotions, from which he derived some benefit. He continued at his usual occupation. The tumour enlarged gradually, and seriously inconvenienced him. Various local applications were tried from time to time, and he took medicines, but no remedy checked the growth of the tumour. He was then recommended to come to Dublin and place himself under my care.

Appearance of Patient and Scrotum on his Admission.—The patient is a muscular young man, and appears to be in sound health. On examination the right side of the scrotum was found to be very much enlarged. The swelling commences in the inguinal canal,

above the external abdominal ring, and gradually enlarges. The tumour is about the size of a cocoa-nut; is heavy, solid, and slightly elastic. The rugæ are obliterated, and the raphe is pushed to the opposite side. The integuments are not adhering. One part of the tumour feels like a cyst. I punctured it with an exploring needle. Sero-sanguineous fluid escaped, which was examined microscopically. No cancer cells were detected. The left testis is of natural size. Measurement of tumour:—from commencement of swelling in the inguinal canal to the lower part of the scrotum, 8 inches; circumference of scrotum, 16 inches (*vide* Plate III., Fig. 1). A consultation was held, and it was decided that the tumour should be removed. The patient was accordingly brought into the operation theatre, placed upon the table, and chloroformed, which was done with unusual facility. Having grasped the tumour behind, I commenced by making an incision through the integuments from the external abdominal ring to the bottom of the scrotum; the several coverings were rapidly cut through, and on opening the tunica vaginalis some serous fluid escaped. The spermatic chord was isolated by a few touches of the scalpel, and prevented from retracting by means of a piece of tape, which was firmly tied around it, the ends being held by an assistant. I next divided the spermatic chord, and secured each vessel separately in a ligature, and then, with the handle of the knife, detached it from the septum scroti, and, lastly, I dissected the mass from the bottom of the scrotum. There was very little hemorrhage from the scrotal vessels. Cold water was poured into the cavity to remove any clots of blood. The edges of the wound were approximated by means of interrupted iron wire sutures (a free opening being left at the dependent part to allow any purulent discharge to escape). When the operation was completed (which was in a very few minutes), the patient was attacked with the following alarming symptoms, although, as above stated, he inhaled but half a drachm of the purest chloroform, and was in sound health, having no cardiac or other internal disease:—Stertorous breathing, eyes fixed, dilated pupils, cessation of respiration, muscular rigidity, lividity of the countenance, absence of pulse at the wrist; in a word, the patient seemed to be dead. The following treatment was promptly adopted, in which I was ably assisted by my colleagues, Professor Hargrave and Mr. Tufnell, also by the resident pupils and dressers:—Artificial respiration by Silvester's method; electricity was cautiously used, a needle having been

passed down to the phrenic nerve at the root of the neck, and another to the diaphragm. A gum elastic male catheter was passed up into the rectum, and ether with brandy injected. A free current of air was produced by opening the windows, and fanning the patient's face. Friction to the extremities and trunk was also used, and sinapisms were applied to the calves of the legs and over the heart. This treatment was steadily persevered in for nearly an hour before there was any marked improvement. Our efforts were finally rewarded by the resuscitation of the patient. He was soon sufficiently restored to allow of his removal to bed. His face was blue for several days. The wound healed by granulation. The patient's strength was supported with wine, beef tea, and bark mixture. On the 6th day after operation the patient was seized with rigors, and the discharge from the wound assumed an unhealthy appearance. These unfavourable symptoms passed away. Subsequently there was a swelling along the track of the spermatic chord, and threatened formation of matter. Poultices of linseed meal were applied, and abscess did not result. The tumour weighed 24½ ounces, and on section was found to consist of fibrinous masses, with cysts containing blood and serum. The testis, which was of cerebriform appearance, was imbedded in the upper part of the tumour.

The patient was discharged from hospital on the 16th of March, 1864. He has since then corresponded with me frequently, and remains in sound health, and free from any return of the disease.

Case IV.—*Tumour of Strumous Origin, involving the Left Testis—Castration—Recovery.*

M. C., aged thirty-five years, a labourer, resident in the Queen's County, was recommended to me by my friend Dr. Joseph Clarke, of Mountmellick, and was admitted into the surgical ward of the City of Dublin Hospital on the 13th of June last.

History.—Three years ago the left testis became tender and swollen. It gradually increased in size to the present time. Within the last ten days a small spot ulcerated on the front of the tumour. The patient suffers pain like the "sting of a nettle," and he also experiences a dragging feel in the region of the spermatic chord and loins. He says he never suffered from venereal disease.

Condition of Patient and Appearance of Tumour on Admission into Hospital.—His general health appears to be good. The left testis is about the size of a large orange. There are several large veins ramifying over its dependent part. The tumour is heavy. There is one ulcerated spot on the anterior part about the centre, and a prominent point which looks as if it would burst and form a similar ulcer. The spermatic chord feels thickened. There is no glandular enlargement observable. The right testis is of natural size. The patient was under surgical treatment for many months, but nothing seemed to take any effect on the size of the tumour. On consultation with my colleagues it was decided that the tumour should be removed, as the testis was completely destroyed by the disease, and, by causing irritation, prevented the patient from working. I accordingly operated in the following way on the 17th of June. The patient was placed on the operation table, and, when chloroformed, his buttocks were lifted to the end of the table (the hair was removed previously from the pubes and scrotum). I grasped the tumour behind, and made an elliptical incision through the integuments with a scalpel, commencing at the external abdominal ring, and terminating at the lower part of the scrotum. A second elliptical incision of the same length was then made, which included the ulcerated part, and prevented any diseased integument being left. The spermatic chord was carefully dissected out, and held firmly by an assistant in Ricord's forceps. The chord below the forceps was divided, and the vessels were tied separately; the lower part of the chord was then drawn forwards, and the testis dissected from the bottom of the scrotum, to which it was firmly united by adhesions. In separating the organ from the septum the handle of the knife was used to avoid wounding the artery of the septum or the opposite testis. Several bleeding vessels in the scrotum were tied. The wound was left open to allow the surface to glaze, and the patient was carried to bed. Pieces of ice were placed in the cavity, and the part was left exposed to the air. In a few hours, as all oozing ceased, I removed some small clots of blood, and sponged the entire surface of the wound with carbolic acid and oil. The edges of the wound were brought together with interrupted iron wire sutures.

The section of the testis exhibited a well-marked example of strumous disease. A drawing was made by Mr. Burnside of the scrotum before operation, and a coloured drawing of the section of the tumour.

Case V.—*Sero-Cystic Tumour of the Right Breast—Amputation—Recovery.*

M. H., aged forty-four years, residing in this city; married; had two children; previous health good; received an injury of the right breast by a fall on the 1st of April, 1863. The breast soon became enlarged, and occasionally slightly painful; not increased at the appearance of the catamenia. She was admitted into the City of Dublin Hospital on the 1st of July, when she presented the following condition:—Right mamma considerably larger than the left. A swelling is observed (situated two and a half inches above and internal to the nipple) divided in the centre, presenting an hour-glass shape, each portion of the tumour being of the size of a walnut; these fluctuated on pressure. On feeling the breast a hard tumour was found three inches in extent. There was no glandular contaminaton; no pain in the breast after being handled. The nipple was of natural size, and not retracted. There was no appearance in the patient of malignant disease. I amputated the breast, and on section it presented a well-marked specimen of sero-cystic disease. No cancer cells were found on microscopic examination. The wound healed, and the patient made a good recovery.

This patient was under my observation for a long period, and never had any return of the disease.

In submitting to the notice of the profession the foregoing cases as examples of large tumours and operations for their removal, I beg to append a few practical remarks on each case. The first is an illustration of a "pendulous" and movable tumour of enormous size, and of many years' growth, occupying the parotidean space and side of the neck. Such tumours are rarely malignant, but after a certain period the dependent part, in consequence of the weight, is liable to ulcerate and bleed, as in the present instance, demanding removal by operation. The elevation of the tumour for some days before operation (as successfully practised by Mr. O'Ferrall of this city) proved to be of much value in the management of this case. It relieved the patient, materially lessened the vascularity of the tumour, and thereby prevented undue loss of blood during the operation. It is further important, in the removal of such large tumours (when the integuments are sound), to preserve ample skin flaps, as already noticed, in order to allow of approximation of the edges of the

wound. If wide elliptical incisions be incautiously made, a large surface will be exposed, which can only heal by tedious granulation. In securing a very large deep-seated artery in the removal of this tumour, acupressure proved very valuable in arresting the hemorrhage, which the ligature did not control. When the magnitude of the tumour in this case and its situation are considered the result of the operation is very gratifying. The patient is now in the enjoyment of good health, with scarcely a trace of deformity, the line of union only being observable on the lower jaw.

Case II. is an example of a very large tumour of five years' growth, situated on the inside of the right thigh, in a young robust countryman, not traceable to injury, almost painless, movable, and even on the surface, on which there were not any vessels ramifying. The patient's only wish for having the tumour removed by operation was the inconvenience caused by its great bulk, which interfered with the free movement of the limb, preventing him from working. The case having been free from any one sign indicative of malignant disease, it was unanimously resolved to relieve the patient by operation. The close approximation of the tumour to the femoral vessels (in Hunter's canal), and the great sciatic nerve posteriorly, required a careful dissection in the removal of the diseased mass. The handle of the knife and my fingers were chiefly used in detaching the tumour, which was enveloped in a fibrous capsule, and when it fell on the floor it presented an appearance not unlike a football. Very little blood was lost during the operation. The wound suppurated, the discharge being sanious and very copious, and healed by granulation.

A section of the tumour presented a cerebriform appearance, with cysts containing clots of blood. The patient returned to the country, and remained in good health for several months. It is but right, however, to add (as I am informed), that in less than a year a swelling appeared in his groin, which finally fungated and bled, and that he died in consequence.

The diagnosis of benign from malignant tumours is not unattended with difficulty, as the history of the foregoing case illustrates. It was the unanimous opinion of the many surgeons who examined the tumour that it belonged to the former class, and was a very promising case for operation. The termination of the case, however, clearly shows that the disease was encephaloid (called Fungus Hematodes by Hey), notwithstanding the absence of any suspicious symptoms. It is worthy of note, that the first case of fungus hematodes

related by the celebrated Hey (see Chap. vi. of his "Surgery") occurred, as in my patient, in a stout young man, twenty-one years of age, and was also situated on the inside of the right thigh. The tumour was two years growing before he was admitted into the Leeds Infirmary, and had attained an enormous size; it was explored by Hey, and was found to contain a very large quantity of substance not unlike coagulated blood, but more resembling the medullary substance of the brain. Mr. Hey performed amputation of the thigh; the stump healed, but in six weeks a secondary tumour arose from the situation of the cicatrix. A second amputation was performed, and the stump healed. The patient went to the country, but was soon attacked with dyspnea, cough, and profuse night sweats, and died in half a year after his discharge from the infirmary, Mr. Hey says from consumption, but manifestly from contamination of the thoracic viscera with the same malignant disease.

Abraham Colles, in his "Surgical Lectures," says:—"The last case I saw of fungus hematodes was in the thigh of a woman. She died, and on examining the abdomen *everything in that cavity was perfectly sound*, but on opening the thorax the lungs were found affected with it extensively." It is remarkable that the disease in this case recorded by Mr. Colles also occurred in the thigh, and subsequently involved the thoracic viscera, and thus, in these two respects, very closely resembled Case II., which I have related.

Cases III. and IV. are examples of large tumours involving the testis, requiring removal by operation, one being fibro-cystic, and the other of strumous origin. The steps of the operation in each case I have already detailed.

Case V. was a specimen of sero-cystic tumour of the breast, which was successfully removed by operation.

I shall now relate a series of interesting cases of tumours which were unsuited for operation, and shall conclude with observations on the characteristic features of malignant, contrasted with benign growths:—

I.—ENCEPHALOID TUMOUR OF LARGE SIZE SITUATED ON THE ABDOMEN OF A GIRL.

II.—ENCEPHALOID TUMOUR, SITUATED ON THE UPPER THIRD OF THE LEFT ARM, IN A YOUNG MAN.

III.—ENCEPHALOID TUMOUR ON THE BACK OF THE WRIST.

IV.—ENCEPHALOID TUMOUR IN THE RIGHT GROIN.
V.—ENCEPHALOID TUMOUR, SITUATED OVER THE MASTOID PROCESS.
VI.—ENCEPHALOID CANCER OF THE LEFT BREAST.
VII.—ENCEPHALOID CANCER OF THE EYE-BALL IN AN INFANT.
VIII.—ENCEPHALOID CANCER OF BOTH TESTICLES.

CASE I.—*Encephaloid Tumour of Large Size situated on the Abdomen of a Girl.*

M. M'E., aged twenty years, a fine robust country girl, residing in the county of Meath, was admitted into the City of Dublin Hospital under my care, on the 26th of November, 1866, with a large tumour on her right side.

History.—She felt a small kernel, *four months* ago, midway between the last rib and the crest of the ilium. It was movable, and not painful. It grew *rapidly*, and at the end of two months became painful, and soon acquired a large size, which induced her to seek for surgical relief, and she accordingly came to Dublin for that purpose. On her admission into the hospital the tumour measured eight inches in the transverse axis, and four inches from above downwards. It was apparently the size of a cocoa nut, of firm feel, and harder at some parts than others; movable and painful when handled; skin not discoloured, and no large vessels were observed on the surface. There was no apparent constitutional disturbance, and no glandular enlargement. The girl, to all appearance, was in the soundest health. She ate heartily, but slept badly. I punctured the tumour with a long exploring needle; a few drops of blood only escaped. In two months (February) the tumour had increased one inch in extent, became red and more painful. Leeches and ice were applied, and tonic mixture containing iodide of potassium was administered, with an anodyne draught at night. In consequence of the deep situation of the tumour and its position on the abdomen, its rapid growth and painful nature, I declined operating. The poor girl was seized with erysipelas of the head and face, which rapidly extended to the larynx and lungs, producing erysipelatous bronchitis of the severest form, which resisted all treatment, and she died on the 22nd March, 1867.

I removed the tumour the day after her death. The abdominal muscles, at the part corresponding to the tumour, were absorbed, and the diseased mass lay almost on the peritoneum. It had no investing capsule, and was supplied by large blood vessels.

On section, the tumour presented a cerebriform appearance, with large clots of blood, and the microscopic examination showed it to be encephaloid cancer. A drawing was taken by Connolly, which I have amongst my collection. The tumour is preserved in the museum of the Royal College of Surgeons.

Case II.—*Encephaloid Tumour, situated on the Upper Third of the Left Arm, in a Young Man.*

J. M'C., aged twenty-five years, son of a farmer residing in Enniskillen, was recommended to come to Dublin to consult me, in March, 1868, by my friend Dr. Bagot, of Enniskillen, under whose care the patient had been, and from whom I received the following history:—

The patient always enjoyed good health until a year ago, when he felt a pain near the insertion of the deltoid muscle of the left arm. The pain was worse in wet weather. In six months the upper part of his arm commenced to enlarge, which the patient described as "a welt around the limb," and so continued increasing in size until six weeks ago, when, in helping to lift a sack of potatoes, he felt something crack in his arm, which caused him much pain. From that time the swelling increased rapidly. About three months ago a small lump appeared at the left sterno-clavicular articulation.

Appearance of Patient and Arm.—Face pale, extremely anxious, and indicative of constitutional distress. Pulse rapid and feeble. The patient sweats profusely at night. He has not any cough. He supports the affected limb in a sling. On removing his clothes (which was obliged to be done very carefully, as the slightest movement of the arm pained him), I observed a large swelling of the upper two thirds of the left arm. The integuments were of a dusky red colour, and large blue veins ramified on the surface. The shoulder-joint was not apparently implicated. The forearm was swollen, and the limb was of great weight. There was also a swelling about the size of an egg at the left sterno-clavicular articulation. On consultation with my colleague, Professor Geoghegan (who agreed with my view of the malignant nature of the case), we decided that operative interference should *not* be resorted to. Amputation at the shoulder-joint, the only other resource, was too serious an alternative, considering the exhausted condition of the patient; and the enlargement at the sterno-clavicular articulation, at once decided the question. This

was also the opinion of the man's own medical attendant, Dr. Bagot. Before the patient returned to the country I had a coloured photograph taken, exhibiting the shoulder and his delicate appearance. The tumour fungated, and bled twice. The hemorrhage was arrested on each occasion by the muriated tincture of iron. About a week before his death he suffered from retention of urine, requiring the use of the catheter. Subsequently paraplegia and brain symptoms set in, and he died on the 27th of May, two months after I saw him, from the exhaustion produced by these desperate complications. It is a curious fact that this case of encephaloid tumour corresponds, in almost every particular, with the last case recorded and illustrated by Hey in his chapter on fungus hematodes. It is still further a strange coincidence that the following case of the disease occurring on the wrist bears a remarkable similarity with Case X. recorded by Hey:—

CASE III.—*Encephaloid Tumour on the Back of the Wrist.*

In June, 1867, I was requested by the late Dr. Asken to visit M. R., aged fifty-eight years, who was suffering from a swelling on the back of her right wrist. She enjoyed good health until a year and a half previously, when she first complained of pain in the part, and in a short time subsequently a small kernel appeared on the wrist, and gradually increased in size. On examination I found a tumour as large as an orange, narrowed at its attachment to the wrist. The integuments were red, and several large veins and pulsatory arteries were observed on the surface. The pain increased in severity. The patient became pale, lost her sleep, and her general health soon suffered. In one month the tumour fungated and bled; bright arterial blood came per saltum, and was arrested by means of the muriated tincture of iron, with compresses of lint and digital pressure, on several occasions. Severe cough attacked her in the winters; she perspired at night, and was much emaciated. The discharge from the wrist was copious, sanious, and fetid. The tumour did not increase in size, but she sank gradually from exhaustion.

CASE IV.—*Encephaloid Tumour in the Right Groin.*

J. D., aged twenty-five years, residing in the county of Sligo, was admitted under my care into the City of Dublin Hospital early in the present year (on the recommendation of my friend, Dr. Wm.

Armstrong, of Collooney), suffering from a tumour in the groin. The patient stated that the disease commenced as a small kernel about a year and a-half previously; the swelling gradually increased in size, and soon attained the size of a small apple. On admission into hospital, the patient presented a pale, sallow, and anxious expression; he had cough and perspirations; rapid pulse; bad appetite, and loss of sleep. He suffered intense burning pain in the affected part. On examination, I observed a tumour in the right groin, about the size and shape of a large orange; the integuments covering the tumour were ulcerated, and discharged a very fetid ichorous fluid. On manipulating the diseased mass, it was found to be firmly fixed over the femoral vessels; the surrounding integument was tense and brawny to the touch; there was no glandular enlargement. The patient fancied that the tumour contained purulent matter, and urgently requested me to relieve him by operation, a request which I was obliged to decline. By my advice he returned to the country. The tumour, as I was informed by Dr. Armstrong, soon became of enormous size, and the patient died in great suffering in one month after his return home. A cast of the tumour was taken before he left the hospital.

Case V.—*Encephaloid Tumour situated over the Mastoid Process.*

J. R., aged nineteen years, daughter of a labourer residing in the country, apparently the picture of health and strength, consulted me early in the year 1867, on account of a small tumour situated over the left mastoid process, causing her annoyance on account of disfigurement. She stated that about five years previously she met with the following strange accident:—A boy was shooting with a bow and arrow; he shot the arrow up into the air; on falling down, it struck her in the ear, which it passed through, and stuck in the mastoid process, and had to be pulled out. She often said, before any swelling appeared in the part, that she felt the spot which was struck becoming very sore. When I first saw her, the tumour was about as large as a walnut, very hard like cartilage, movable, and slightly painful when pressed; there was not any constitutional disturbance. I admitted her into hospital, and removed the tumour, which was found firmly adherent to the surrounding structures. The wound healed, and the patient left the hospital apparently in good health.

In a few weeks she again consulted me, in consequence of constant pain behind her ear, which darted up the back of her head and

down her neck, depriving her of sleep. A fresh tumour soon sprang up in the line of the cicatrix, and quickly attained about the size of a small apple; the integument covering it assumed a red colour, with large ramifying vessels. She was re-admitted to the hospital on the 7th of May, 1868. The tumour spread rapidly, and penetrated into the external ear, discharging a very fetid and bloody fluid; it bled repeatedly; the girl lost her ruddy complexion; she perspired at night, and took but little food. The left cheek became enormously swollen, and facial palsy resulted in consequence of the deep-seated pressure of the diseased mass on the portio-dura nerve. She was ordered full opiates, tonics, wine and beef-tea. She urgently entreated me to try and relieve her by operation, which I was most unwillingly compelled to refuse. She shrieked from pain, and was occasionally delirious. She returned to her home, and died in the greatest agony, worn out by pain and repeated hemorrhages.

Case VI.—*Encephaloid Cancer of the Left Breast.*

C. M., aged fifty years, mother of several children, consulted me in the summer of 1863. A year and a-half previously she felt a kernel in the left arm-pit. The swelling became painful and grew rapidly; large blue veins ramified over its surface, compared by the patient's friends to the branches of a tree. When I saw her the breast presented a most remarkable appearance, being of huge size. She died exhausted by pain and profuse perspirations. The woman who attended her in her last moments said that large quantities of brain-like matter burst through the breast.

Case VII.—*Encephaloid Cancer of the Eye-ball in an Infant at the Breast.*

The child of a countrywoman was brought to the City of Dublin Hospital about three years ago, presenting the following appearance—the eye-ball was protruded from the socket, and the child was very drowsy. Professor Jacob exhibited the case to the pupils, and pronounced it to be hopeless, and consequently unfit for operative interference.

Case VIII.—*Encephaloid Disease of both Testicles.*

A man about twenty-five years of age, a native of the county of Kilkenny, was admitted into the City of Dublin Hospital during the last winter under my care, on the recommendation of my friend,

Dr. Charles G. Lyster, of Kilkenny. The patient had been suffering for some years from enlargement of each testis; latterly the scrotum became of such enormous size and weight that he was unable to go about. On admission he presented a sallow and anemic appearance, and a tumour, about the size of a small orange, was observed under the left angle of the jaw. He died on the next day. I made a *post mortem* examination, assisted by my colleague, Dr. Hewitt, and by Dr. Barker, Curator of the College of Surgeons. On laying open each side of the scrotum by vertical incisions, a large quantity of serous fluid escaped; the diseased mass was of the consistence of cartilage—firm, elastic, and of grey colour. A microscopic examination of the diseased mass was made by Dr. Barker, who found that it presented the characteristics of encephaloid cancer.

This remarkable specimen of cancer of huge dimensions in both testicles is preserved in the Museum of the Royal College of Surgeons; a cast of the scrotum is also to be seen in the Museum. On opening the abdomen, several pounds weight of cancerous masses were found in the mesentery, and both kidneys were involved in the disease.

The cases of malignant tumours which I have now detailed were well-marked examples of encephaloid disease, occurring chiefly in young persons, and situated in various parts of the body. The disease has been differently designated by authors. Hey terms it "fungus hematodes;" Monro, "milt-like tumour;" Burns, "spongoid inflammation;" Paget, "medullary cancer." When situated in the intermuscular spaces (says Paget) "it presents to the touch a peculiar softness, or a deceptive sense of slow fluctuation of some thick fluid, so that even to the most experienced the diagnosis from collections of fluid is often doubtful." The shape of these tumours is round or oval. The materials composing the soft variety of the disease are soft, close, brain-like, and of grey colour, variegated with blood, and, when scraped, yield abundant "cancer juice," of milky or creamy material. The firm medullary cancer (such as existed in the case which I recorded as occurring in the testis) is elastic, tense, compact, and moderately tough. Dr. Kerr defines encephaloid disease "as a morbid condition of the body, evinced by the development of an elastic uneven tumour, or tumours, not painful in the early stage, and becoming so only by implication with surrounding parts, tending to ulceration, and presenting to view a soft and spongy fungus, rapid in its growth,

readily bleeding in vascular textures, and emitting a peculiar serous discharge, of a very fetid odour, more or less coloured with blood."

Among 103 tabulated instances of medullary cancer in external parts (says Paget), the seat of primary disease was in the

Testicle,	in 29	cases.
Bones (most frequently in the femur),	21	„
Limbs (especially in the intermuscular space),	19	„
Eye-ball, or orbit,	10	„
Breast,	7	„
Walls of the chest or abdomen,	5	„
Lymphatics,	4	„
Various other parts,	8	„
	103	

Medullary cancer very seldom attacks both testicles, either at one time or in succession. When affecting the testicles the swelling has been confounded with hydrocele and cystic disease. Its progress is not always quick, being at one period slow, and at another time rapid in growth. It is one of the most fatal and incurable of diseases, there being no specific remedy, and operative interference is not only questionable, but most unpromising; and although there is generally, in the early stages, no glandular contamination, yet the poison quickly seizes on the viscera—lungs, liver, kidneys, brain, and spinal chord—such contamination being usually indicated by the *sallow*, greenish colour of the skin, clammy sweats, and other symptoms of constitutional disease; and when removed by operation from one part of the body, the complaint is sure to recur rapidly in some other region.

Having met with so many cases of this dread malady in my practice, and consequently feeling much interest in the subject, I considered that the publication of the foregoing details should not be without sufficient interest and practical importance to justify me in submitting them to the notice of the profession.

ART. XI.—*Ulster Medical Society—Inaugural Address of the Session* 1868–1869. Delivered by the President, JAMES CUMING, M.A., M.D.; Professor of Medicine Queen's College, Belfast, &c.

GENTLEMEN—It is a portion of the duty which devolves on me, as President of this Society, to address to you some observations

introductory to our Winter Session. In the first place, permit me to return you thanks for the honour which you have conferred upon me in electing me to this chair. Nothing could be more gratifying to me than such a spontaneous mark of regard coming from my professional brethren, and I had no hesitation in accepting it, knowing that I could rely on your kindness and consideration to aid me in the discharge of duties for which I might otherwise have felt myself inadequate.

Sixty-two years have elapsed since this Society was founded; for we are the legitimate successors of those who originated the Belfast Medical Society in 1806, although its continuity was temporarily interrupted before its re-organization in 1822. In 1862, the Clinical and Pathological was amalgamated with the Medical Society, and the name of Ulster Medical Society adopted. From that period the meetings have been more frequent, and the number of contributions from the members have considerably increased.

We owe much to our predecessors in this Society. They formed and transmitted to us an admirable collection of works, amounting to above five thousand volumes, and including a large number of rare and curious works, which are invaluable to the student of the history of medicine. They have handed down to us also gifts still more precious in the memory of lives honourable to their profession and useful to the community in which they lived. The annals of a town which has produced many distinguished citizens, record no names which deserve a more honourable place than those of Drennan and M'Donnell, who were among the original members of this Society.

In 1806, the medical profession in Belfast numbered nineteen members; the town contained 22,000 inhabitants. Now there are eighty-one practitioners of medicine, and the population of the town probably exceeds 150,000.

The period of the foundation of the Society was one of great intellectual activity in medical science. Jenner's great discovery of vaccination had been first announced eight years before, and was rapidly making its way into public notice. Hunter's famous treatise on the blood and on inflammation, which changed the face of the existing pathology, had been published in 1794. Abernethy was in the meridian of his unequalled reputation. Astley Cooper and Charles Bell were rapidly rising into eminence. Dupuytren had just been appointed to the Hotel Dieu, where his surgical ability was so long unrivalled. Laennec, to whom our art

owes more than probably to any single man of either ancient or modern times, was commencing the investigations which have rendered such imperishable services to the science and practice of medicine. Cuvier was in the zenith of his fame.

The whole method of investigation had also undergone a complete change. Authority was no longer regarded as paramount. The ancients, it is true, had been long dethroned, but, in their stead, more modern masters had arisen, whose teachings had acquired a sway over the minds of physicians almost equalling that exercised by Hippocrates or Galen. Twenty years before the celebrated Cullen related an anecdote, in a lecture which he delivered in the University of Edinburgh, which shows how the authority of Boerhaave was enough to weigh heavily on the freedom of inquiry. "My friend and patron, George Drummond (Provost of Edinburgh), came to me," he said, "requesting seriously that I would avoid differing with Dr. Boerhaave, as he found my conduct in that respect was likely to hurt myself and the university also." He adds, with characteristic prudence, "I promised to be cautious; and upon every occasion I spoke very respectfully of Dr. Boerhaave." Now, with the growth of science, and with the development of new means of investigation, the received opinions were examined with a freedom and minuteness which had been before unusual, and from which results of the highest value soon flowed. Looking back on the state of knowledge at the beginning of the century, we can recognize the vast strides which have been made in every department of medicine.

Now, this very progress, of which we are justly proud, has been made a subject of reproach to the profession of medicine. The pharmacopeias of past generations have been disinterred, and the public made merry with such complex formulæ as the Aqua Coelestis and the Mithridate Andromachi. The opinions, often, it must be admitted, crude and fantastic enough, of the earlier physicians, have been cited as evidence that medicine has been practised without any solid foundation for its precepts and methods. In reality, however, this only proves that the growth of medical science has been accompanied by errors and imperfections, such as are known to have occurred in abundance during the development of other branches of knowledge. The history of astronomy, of chemistry, of geology, afford us multiplied examples of speculations as baseless as those of Paracelsus or Van Helmont. Besides, it must be remembered, that physicians could not be mere *curiosi naturæ*—could not

be content to be simply spectators of phenomena. They found themselves in the presence of formidable maladies, of devastating epidemics, and these they had to meet with the best means at their disposal. In the face of difficulties and danger, often of the most urgent character, sometimes of even appalling magnitude, they had to act with the limited knowledge which they possessed. No doubt many of their principles were erroneous, and much of their practice useless, some even mischievous, but still their knowledge was always vastly in advance of the popular notions of their day.

It is easy to point out mistakes into which they have fallen, just as it is easy to discover defects in the criminal legislation of our ancestors, in their notions of political economy, and in many of their methods of administration; but we know how incomparably better than anarchy is even an imperfect system of government; and in estimating the value to the world of the medical art of earlier times, we must bear in mind the extreme ignorance of medical subjects which was shared by the foremost intellects of their generation.

When the student of the history of medicine is wearied and disheartened by the laborious trifling and the idle discussions of his predecessors, let him turn to the pages of the most eminent contemporary authors, and learn their opinions on kindred subjects, and he will rather wonder at the acuteness and penetration of the earlier physicians. It is only by investigations of this kind that we can calculate the true position which the cultivators of medical science have held in relation to the general progress of human knowledge. It may not, accordingly, be devoid of interest, if I allude to some of the opinions on medical subjects held by several of the foremost thinkers of modern times; selecting only those philosophers who have given serious attention to questions connected with our art, and who have given deliberate expression to their views. Nor need we search for our examples among the followers of Aristotle and the ancients; we can find them in abundance among those most deeply imbued with the new methods.

Probably we could find no more typical representative of modern thought and of the spirit of modern investigation than Bacon. He, more than any man of his generation, had thoroughly broken with antiquity. Bacon had a high idea of physic, and a genuine respect for physicians, although, according to a custom which is not altogether unknown even in the present day, he was fond of lecturing them on their shortcomings, and of giving them a good deal of perfectly well-intentioned advice.

"Medicine," he tells us, "is a science which hath been more professed than laboured, and yet more laboured than advanced." He advises physicians to raise their thoughts above common cures to the subject of prolonging and renewing the life of man, and he brings against them a charge, which has certainly not often been repeated, of prescribing in too simple a manner, and of not combining together a sufficient number and variety of drugs. In addition, however, to his criticisms, he has given an elaborate exposition of his own views as to the means by which life may best be prolonged and renewed. It may be interesting to touch upon some of his opinions on this subject, as an example of how a problem of this kind was dealt with at the beginning of the seventeenth century by one of the foremost intellects of modern times.

Life, according to Bacon, may be effectually prolonged by a combination of ten operations. Of these the first is,[a] "The operation upon the spirits to renew their freshness." This is to be accomplished by various means, of which the principal is the daily use of from three to ten grains of nitre. This remedy refrigerates and condenses the spirits, and he conceives it to have been specially created for that object.

The second operation is the exclusion of the external air from the surface of the body. This is to be effected by closing as completely as possible the pores of the skin. For this purpose astringent baths are to be used, and the surface of the body smeared with oil. Passing over the intermediate operations, we come to the ninth, which is, perhaps, the most curious of the whole. It is entitled, "The operation upon the inteneration of the parts which have become dry, or the softening of the body." It is intended to counteract the drying and hardening of the body, which occurs as age advances; and is to be effected by baths and by anointings.

"In the fable," he informs us, "of the restoration of Pelias to youth, Medea, when she pretended to set to work, proposed to accomplish it by cutting the body of the old man to pieces, and boiling it up in a cauldron with certain drugs. Some boiling may perhaps be required for the purpose, but the cutting to pieces is unnecessary."

The best bath, according to Bacon, is one composed of the warm, fresh blood either of man or of animals; but as this is somewhat

[a] "Historia Vitæ et Mortis." In this and in the following quotations I have used, with a few slight alterations, the version of Headlam, given in the edition of Bacon's works by Spedding, Ellis, and Heath.

loathsome, it may be replaced by other substances of a nutritive character. The Baconian prescription for this unique bath is that it should be composed of the fatter kinds of flesh, such as beef and pork, with oysters, milk, butter, yolks of eggs, wheatmeal, and wine sweetened with sugar or honey. To these should be added salt, saffron, mastic, myrrh, and myrtle-berries.

"The operation will become far more powerful if the proposed bath (which I hold to be the principal thing) be attended by a course and order of four operations. First, before bathing, rub the body and anoint it with oil mixed with some thickening substance, that the power and moistening heat of the bath, rather than the watery part, may enter the body. Next, get into the bath, and remain there about two hours. After the bath cover the body with a plaster of mastic, myrrh, tragacanth, diapalma, and saffron, to keep in the perspiration as much as possible, till the soft matter has by degrees become solid, and keep it on for twenty-four hours or more. Lastly, after taking off the plaster, anoint the body with a mixture of oil, saffron, and salt. Renew the bath with the plaster and unction as before every fifth day, and let the process of softening the body continue for a month."

I think it would be difficult to find anywhere a series of directions more likely to injure the health, or more directly antagonistic to sound notions about the animal economy, than those which we have quoted from the father of modern experimental philosophy.

About the same time that Bacon was announcing this discovery to the world—a discovery which was, in his eyes, so important, that he advanced the treatise containing it to an earlier place in the *Instauratio Magna*, so that no time should be lost in making it public—Harvey, then lecturer on anatomy and surgery at the College of Physicians, was announcing his immortal discovery of the circulation of the blood. Indeed, it is stated that Harvey was physician to Bacon himself, as well as to James I., and that he had formed a low estimate of Bacon's powers, having probably judged of them from the character of his physiological speculations. "He writes philosophy like a Lord Chancellor," Harvey is reported to have said in derision.

Physiological subjects were treated of at much length by another illustrious philosopher, Descartes, who may be regarded as standing in the same relation to modern psychology that Bacon does to modern experimental philosophy. Descartes, who was a man of spotless character, had, like Bacon, studied the means of ensuring longevity,

and had arrived at the conclusion that the surest method of preserving life is not to fear death.[a] He was well acquainted with the circulation of the blood, and his advocacy of Harvey's views contributed powerfully to bring about their acceptance throughout Europe.

He published a treatise on man, which was the fruit of fifteen years of anatomical study and observation, in which he explained his views as to the manner in which the circulation was maintained.

There is, according to Descartes,[b] a non-luminous fire contained in the pores of the substance of the heart which renders it so extremely hot that the blood on entering it becomes at once dilated, and brought to the condition of vapour. In this gaseous state it is sent to the lungs, where it is cooled and restored to the liquid state, and in this condition returned to the left side of the heart. No sooner, however, does it again enter the heart than it is again rarified by the fire contained in that organ, and in this way is driven into the arteries.

Descartes made some considerable discoveries in physics, but it is evident that his fifteen years' study had not enabled him to much advance our knowledge of vital processes.

It is well known that the benevolent mind of Berkeley, one of the most acute of modern metaphysicians, was filled with the notion that in tar water, made by pouring a gallon of cold water upon a quart of tar, he had found a panacea for all the ills of humanity. So profoundly was he impressed with the importance of his favourite remedy, that we find him declaring:[c]—"As the old philosopher cried aloud from the housetop to his fellow-citizens, 'Educate your children:' so, I confess, if I had a situation high enough, and a voice loud enough, I would cry out to all the valetudinarians upon earth, 'Drink tar water.'" He even attributed to this wonderful fluid a subtle influence on the development of the intellect. "Nor is it only useful," he says, "to the bodies of infants, it hath also a good effect on their minds, as those who drink it are observed to be remarkably forward and sprightly. Even the most heavy, lumpish, and unpromising infants appear to be much improved by it. A child there is in my neighbourhood, of fine parts, who at first seemed

[a] Au lieu de trouver le moyen de conserver la vie, j'en ai trouvé une autre plus sûr, c'est celui de ne pas craindre la mort. Œuvres de Descartes par Cousin.—Tome i., p. 112.

[b] L'Homme. Œuvres. Tome iv.

[c] A Letter to T—— P——, Esq., containing some further remarks on the virtues of tar water, and "Farther Thoughts about Tar Water."

stupid and an idiot, but by constant use of tar water grew lively and observing, and is now noted for understanding beyond others of the same age." When we remember that this passage was published in 1752, when Cullen and William Hunter were teaching medicine and anatomy, we shall have no reason to doubt that, on their own ground, the physicians of the day were more than a match for the metaphysicians.

Coming to more modern times, we may select, as a final instance, the greatest speculative philosopher of Germany, the celebrated Kant. Kant had the singular misfortune to be impartially and eminently wrong, both in what he believed about medicine and in what he disbelieved. He was an enthusiastic admirer of the absurd Brunonian system, which hardly survived its birth, and of the puerilities of Beddoes; and he was strongly opposed to what has proved an inestimable blessing to the human race—the practice of vaccination.

It would not be amiss, when we are lectured by some of our contemporaries on the defects of our art, to remind them of the errors into which men greater than they have fallen when they ventured into our domain, and to counsel them to learn humility from the example of Bacon, of Descartes, of Berkeley, and of Kant.

I have adduced these instances, to which it would be easy to add many others, not with the idle notion of depreciating the labours of the great philosophers to whom I have alluded, but to show the inherent difficulties of the study of medicine, the danger of regarding the facts or generalizations derived from other sciences as adequate to its elucidation, and the absolute necessity for a minute and accurate as well as comprehensive knowledge of the phenomena of disease before venturing to even speculate upon its theory, much less to meddle with its practice.

It was acutely remarked by Bichât that pathology, the science of disease, has no exact analogue among the physical sciences. Physiology bears the same relation to living bodies that astronomy, mechanics, and the other branches of natural philosophy do to inert matter. But there is no pathology of any of the physical sciences. We cannot suppose gravitation to be variable in its operations, or chemical affinity as liable to diseased action. Nor can we conceive these forces as susceptible of being influenced by medicaments. Accordingly the processes of disease must be studied by and for themselves, and they, as well as the modes of modifying them, and of restoring healthy action, must be made the subject

of special investigation, which is to be conducted according to the general principles which govern all scientific research, but which must not be dominated by ideas derived from any other branch of inquiry.

Even as regards the impression produced on the mind, there is a marked difference between the contemplation of vital phenomena and that of the operation of the physical forces. The study of life and of its manifestations conveys the idea of tumultuous action and energy, of effort sometimes baffled, sometimes victorious, of a strife and turbulence, so to speak, compared with which the majestic regularity and unvarying precision of the physical forces seem the type of serene and immutable power.

When chemistry and physics, and anatomy and psychology, have said their last word, we are still only on the threshold of medicine, and it is from a neglect of this important truth that so many mistakes have been committed. There is no doubt that many of the ablest physicians have proposed theories which have not borne the test of subsequent investigation, but there was this important peculiarity with regard to most of these theories, that the experience and sagacity which their authors had acquired by watching the working of diseases and of remedies saved them from falling into such disastrous errors of practice as those which we have noticed. It has been stated with regard to Sydenham that while his system was very often bad, his practice was generally good. Probably at the present day our practice is in advance of our theory. We all allow ourselves a certain latitude in speculation, but we hold fast by the practical facts which have been gained to us by centuries of observation, and which are none the less valuable because they are often purely empirical. I believe no man living can fully explain why and how opium acts, and yet every physician knows its effect, and how to get from it the maximum effect with the minimum of risk in cases where he considers it to be useful.

Now when we find that the leaders of thought and of progress in their generation fell into the egregious blunders to which we have adverted, we can form some faint conception of the chaotic condition in which the notions of the uneducated mass of the people must have been with regard to medical subjects. Even now, with the vastly greater facilities for the acquisition of knowledge which the spread of education has afforded, we are all aware of the great number of popular errors which we have occasionally to combat, of

the vigour and intensity of popular prejudices, and, at the same time, of how easily a large portion of the world can be dazzled by any specious or confident pretender. When we reflect on homeopathy and hydropathy; when we think of the hundred delusions not more baseless, although generally infinitely more mischievous, which have flourished and been forgotten, we see with what flimsy theories large numbers of the community can be satisfied. And when we think of the cancer-curers, and of the consumption-curers of the countless knaves who prey upon other forms of human infirmity, we can form some notion of the enormous value of our profession to the world, if it possessed merely the negative merit of protecting our fellow-creatures from these cruel, ignorant, and rapacious charlatans.

I should be sorry, however, to be supposed to throw any imputation on the motives of many of those who are incredulous regarding the value of the art of medicine. No doubt in numerous instances this incredulity is the result of genuine conviction, in others the fruit of an imagination too active and soaring to be trammelled by mere facts. Many have "been driven, by strong benevolence of soul," far beyond the regions of common sense and of daily experience. Not very many years have elapsed since I entered upon the study of medicine, and yet during that period, hardly exceeding three lustres, I have witnessed the rise and fall of several all but infallible remedies for various diseases. I have read several publications, before which, in the opinion of their authors, the whole structure of medicine was destined to fall as speedily as the walls of Jericho did before the trumpets of Joshua. I have been solemnly advised, nay warned, to devote my attention to as many systems of cure as would have given me full occupation in their investigation, could I have looked forward to years as numerous as those of "the many-wintered crow," or, as might be hoped for from Bacon's bath, were it as efficacious in producing longevity as it is undeniably disgusting.

The fact is, that while with our present knowledge no great generalization is as yet possible, we have ample scope for the most far-reaching and penetrating intellect in the work which lies at our hand.

A distinguished writer has attributed to the study of medical science an important influence in the development and cultivation of one of the most remarkable intellects of modern times. "No science could have been chosen more happily," says Dugald Stewart,

"to prepare such a mind as that of Locke for the prosecution of those speculations which have immortalized his name; the complicated and fugitive, and often equivocal phenomena of disease requiring in the observer a far greater portion of discriminating sagacity than those of physics, properly so called; resembling, in this respect, much more nearly, the phenomena about which metaphysics, ethics, and politics are conversant."[a]

Even to ascertain what the disease is under which his patient labours, a physician must have an exact knowledge of healthy structure and function, so as to recognize the character and extent of the deviations from them; he must be familiar with the vast range of diseases which have been known to occur, so as to be aware of what is possible; he must possess delicate and experienced tact to be able to ascertain and elicit the symptoms which are present; and as the facts upon which his conclusions must be based are often incomplete, sometimes apparently contradictory, occasionally even wilfully withheld from him, he must possess a power of nice discrimination, and a thoroughly trained logical faculty, to be able to arrive at a correct conclusion as to what the disease is most likely to be, and how far he is warranted in acting on the probability so arrived at. It is essential, also, that his knowledge should be so thorough as to be always and in every emergency at once available for use, a requirement which necessitates such a familiarity with both principles and details as is only to be gained by long and earnest study.

All of us have had experience of the immense amount of time and patience necessary to gain a proper knowledge of human anatomy. We know the wide field embraced by physiology and pathology, by medicine and surgery, and what labour it requires to traverse it with anything approaching completeness. We know the amount of time and attention which it is necessary to devote to the acquisition in the wards of an hospital of some practical familiarity with the daily duties of the life of a medical practitioner; and, reflecting on this, we see how scanty, in reality, is the period allotted to professional studies, and how impossible it is to curtail it by giving up any considerable portion of it to other than professional subjects. We see, too, how essential it is that every one who attempts to master this vast department of human knowledge should come to its study with his reasoning

[a] Dissertation of the Progress of Philosophy since the Revival of Letters.

powers, as far as possible, already disciplined, with his faculties of attention, of abstraction, of comparison, and the like, already exercised and sharpened by a sound and well-directed preliminary education. To such students the acquisition of knowledge is easy and delightful, and from such students we may fairly expect additions hereafter to our knowledge of sterling and solid value.

Within the last few years, and in a great degree, it must be owned, in consequence of the action of the General Council of Medical Education, a considerable advance has been made towards the establishment of a better and more comprehensive standard of general and professional education. Few questions are of greater public importance than this; for everything which tends to increase the efficiency of the members of the medical profession has a direct and obvious bearing on the well-being of the community in which they are to exercise their art. Even, however, among some of the ablest and most enlightened advocates of improvements in our present system, there are signs of a tendency to attach undue importance to those branches of learning which are high in public estimation, and of which the cultivation may be regarded as favourable to the maintenance and advancement of the prestige and the social position of the profession. I cannot, for example, attribute the vigorous efforts which have been made to establish the Greek language as an essential part of the preliminary education of medical students altogether to a conviction of its importance in promoting the ultimate ends of medical education. A superficial acquaintance with Greek is, it would seem to me, comparatively worthless; and any large or thorough knowledge of the masterpieces of its poetry, philosophy, or history, is, as regards the medical student, practically unattainable—indeed, is practically unattained by the immense majority of those who have received what is ordinarily understood to be a liberal education. The arguments which are employed by the advocates of Greek seem to take for granted that the ordinary student will be enabled to at least read the great works of its literature with ease, and that he will derive a high kind of gratification, as well as of æsthetic culture, from the exercise of this power. In addition to this, he is expected to become better acquainted with the principles of universal grammar and with philology and to obtain a more complete mastery over the resources of his own language; and these advantages, it is said, will be cheaply purchased by the admittedly irksome and protracted exertions necessary to master the elements of the language.

I am quite willing to acknowledge that a large and thorough knowledge of classical languages and literature is an indispensable element in the highest culture; and if the circumstances of the country or the position of the profession warranted us in demanding this knowledge from every aspirant to the rank of a medical student, I should welcome any effort in the direction of a result so desirable. But I do not think that the preparation for an ordinary matriculation examination has any considerable effect in this direction. The beauty and perfection of form of the ancient masterpieces can only be felt when the language in which they are contained has become so familiar to us that no effort on our part is necessary to enable us to understand the meaning of the words, and when we have attained to some comprehension of ancient modes of thought and feeling. That this is the result of a partial study of Greek is not likely to be asserted by any one who is familiar with the facts. I think that a more thorough knowledge of Latin, if, in addition the student were required to be acquainted with a modern language, would suffice amply for the grammatical training, and for the æsthetic culture, which are, no doubt, indispensable parts of high education.

It would not be difficult to show to any one, whose mind is not biased by the traditional reverence for classical learning which has imbued so profoundly most of our theories of education, that the study either of the French or of the German language is, as a means of educating the critical faculties, not very much inferior to that of Greek; while as an end—as conferring the power of completely and readily understanding the works written in either of these two modern languages—compared with a similar mastery of the ancient tongue, the balance of advantage is so vastly against the Greek as to preclude the possibility of any serious comparison. In fact, with the exception of its value in enabling the student to more readily understand scientific terminology, Greek may be regarded as an intellectual luxury; and it may be worth observing that in medicine we have really no scientific terminology, in the proper sense of the words. Our names of diseases do not express their systematic relations, as the nomenclature of chemistry does with respect to the substances with which that science is concerned, and, indeed, in the present state of our knowledge, it is highly desirable that we should not attempt the formation of a systematic terminology, so that on this ground also Greek cannot be regarded as necessary.

Again, a more extended and more fruitful use might be made of

the valuable means of training which the natural and experimental sciences afford. The study of these sciences tends to develop and strengthen precisely those powers and faculties which are constantly called into requisition during the exigencies of professional life. Exact observation of facts, careful reasoning, and rigorous scientific method are derived almost of necessity from a sound and judicious training in these sciences. It is essential, however, to bear constantly in mind, in the consideration of this important question, that whatever be the means employed for the purpose, the education of the faculties, in the true and limited sense of the word education, is the important thing. Without this even considerable erudition or extensive knowledge of the facts of natural science will be of little use to the student; nay, may even overburden his undeveloped intellect—

> "Like Saul's plate armour on the shepherd boy,
> Encumbering and not arming him."

With regard to the question of the granting of medical degrees, the Council has done good service. It is probable, as has been observed by Adam Smith, that no examination ever has been, or ever can be, devised, which will give an absolute security to the public that he who has passed it is thoroughly competent to practise medicine. That degrees and diplomas have sometimes been conferred on men who were neither wise nor judicious is probably no secret either in the profession or out of it. But every effort should be made in the interest of justice and of humanity, that as far as is possible a degree should be a *bonâ fide* evidence at least of the acquirements of its possessor. It is quite clear, accordingly, that no competition should be permitted between the corporations who possess the privilege of granting them. No body should be allowed to attract candidates for its qualification by a less extended curriculum, or a less strict and searching examination than those of its rivals. This would at once and finally extinguish the artificial distinction between medical and surgical qualification, which has been a fertile source of evil to the profession.

And now, gentlemen, laying aside the consideration of questions which are specially interesting to ourselves, and regarding the wider one of the position of medicine throughout the world, I think we have ample grounds for congratulation and hope. Never have inquiries and investigations been prosecuted before with such wealth of scientific appliances, or over so many countries, or by

men of such different culture, or under circumstances of so great diversity. Never were intellects of a higher kind engaged in the study of our art. And, what is still more hopeful, we find that with much observation there is little theorizing. Men are now content to proceed upon the solid ground of experience and fact, anxious rather to

"Lay great bases for eternity,"

than to erect unsubstantial and unenduring fabrics of speculation.

Looking forward to the future of our art, I think of it as going onward in sedulous, intelligent, honest investigation of the myriad varieties of the action and suffering of the human body; in the unceasing search after the means by which disease may be lightened or removed, proceeding slowly, it may be, but always on the solid basis of patient, unwearied observation, unhasting, but also unresting.

I think of it, not as quickened by higher motives or directed towards nobler aims than now, for humanity and benevolence are of the essence of the profession of medicine; but as ever gaining truer conceptions of the processes of health and of disease, and deeper insight into their nature; as laying broad and deep the foundations of a structure of knowledge from which, in "an ampler ether, a diviner air," wider views of life and of its manifestations may be obtained.

I think of the conditions of health becoming defined; of the seminal principles of disease becoming recognized; of some medical Newton of the future unveiling for us the mystery of vitality; and, finally, of the noblest and crowning triumph of our art, in the discovery of better, surer, and wider means of preventing, mitigating, or curing disease.

"So from the root
Springs lighter the green stalk, from thence the leaves
More aery; last, the bright consummate flower."

ART. XII.—*On Uterine Hydatidiform Disease, or Cystic Degeneration of the Ovum.* By THOMAS MORE MADDEN, M.R.I.A., L.K. & Q.C.P.I., M.R.C.S. Eng., Assistant Physician Rotundo Hospital.

THE subject of the following communication is one which presents some of the most obscure points connected with obstetric science.

the disease in question being comparatively rare, and very little being as yet ascertained as to its pathology, or the causes of its occurrence. Sir James Simpson mentions only one case of hydatid ovum in his "Obstetric Memoirs." Drs. Hardy and M'Clintock, in their "Report of the Practice of the Rotundo Hospital" during a term of three years, in which an account is given of 6,634 cases of parturition, speak of only one case of uterine hydatids. Dr. Meadows, in his "Manual of Midwifery," tells us that he has met with but two cases of this kind. Drs. Sinclair and Johnston, in their "Practical Midwifery, comprising an Account of 13,748 Deliveries in the Dublin Lying-in Hospital," give the particulars of only four cases of hydatid delivery, which took place in the hospital during the mastership of the late Dr. Shekleton. And in his treatise on "Diseases of Women," Dr. M'Clintock, after an experience of ten years in connexion with the Dublin Lying-in Hospital, tells us that he has met but nine cases of this nature. Therefore, as it seems to me the duty of every practitioner who encounters any case not commonly witnessed to place the facts he may observe on record, I now submit the particulars of two cases of uterine hydatidiform disease, one of which came under my notice several years ago, and the other of which occurred very recently, and I have added some observations which have suggested themselves to me, and a sketch of the literature of this very obscure subject, which I venture to hope may be of interest to those who devote themselves to this branch of medical science.

Case I.—On the 4th of October, 1860, I was requested to visit Mrs. K., who, I was informed, was threatened with a miscarriage. She was twenty-two years of age, and had previously given birth to two children at the full time. She stated that she believed herself to be five months pregnant, and her abdomen presented the ordinary appearance of a woman about that time advanced in pregnancy. For three days before I saw her there had been a considerable amount of clotted blood discharged from the uterus, and the midwife assured me that she had distinctly felt the placenta presenting. On examination, however, I found the os small and rigid, and discovered the supposed placenta to be nothing but a rather firm clot. Her pulse was extremely weak and thready, and I gave her an opiate draught and employed cold applications to the vulva. In about two hours from this time a larger clot than had yet appeared was discharged, together with some fluid blood, and was followed

by a large mass of hydatids and fresh clots, which filled a large basin. These hydatids were of the usual character of such formations, though some of them were larger than those generally met with, consisting of pedunculated spheroidal cysts, varying in size from a currant to a plum. As the hydatidiform mass was very slowly expelled, a dose of ergot was administered, and the discharge continued at intervals for upwards of an hour. When it had ceased, and the uterus, stimulated by pressure with a cold hand, had firmly contracted, I bound her up in the usual manner. She complained greatly of after pains, but, with this exception, her recovery presented nothing worthy of notice.

Case II.—Eliza Fox, aged fifty-three, married, the mother of fourteen children, was admitted into the Rotundo Lying-in Hospital, September 30th, 1868, suffering from hemorrhage. The history of her case, which I took down from herself, is as follows:—She was last pregnant eight years ago, and her menses have not yet ceased. For the past twelve months there had been a constant red discharge from the vagina, and at the same time her abdomen had been increasing in size; she did not, however, believe herself pregnant, owing to her time of life. During the same period occasional gushes of red watery fluid from the uterus were observed. On the 17th of September a smart attack of hemorrhage occurred, and three days later regular labour pains, as she says, set in, accompanied by hemorrhage—these occurred at long intervals; and on the 27th a large mass, which appears from her description to have consisted of hydatids, was expelled from the uterus. On the 29th the hemorrhage and pains returned, and after two hours of strong labour pains a small fetus, as she says, "about as long as her hand," was expelled—this appears to have been blighted at an early period of pregnancy, and was followed in due course by the placenta. Some hydatids now also came away. Dr. A. Speedy was then sent for, and had her removed into this hospital. As the discharge of blood still continued, half an hour after her admission, Dr. Beatty removed a mass of hydatids from the uterus, after which the hemorrhage did not again return. These hydatids are thus described by the pupil on duty in the case book:—"She expelled several masses, varying in size from a pea to a grape; some round, others oval; the small ones rather transparent, the large ones of a straw colour; some were separate, others attached to a solid mass; evidently hydatids of the third order." The specimens

I have preserved of these hydatids are well described in the foregoing extract from the ward book. The patient made a good recovery, and I discharged her on the 8th of October, having kept her only eight days in the hospital.

What the nature is of the pathological change which leads to the formation of these abnormal growths in the uterine cavity is a matter on which the most conflicting opinions have prevailed, and as the subject is one of some interest, practically as well as theoretically, I have now collected together the opinions of the most eminent writers, ancient and modern, on this question. The numerous theories by which the formation of inter-uterine hydatidiform masses have been accounted for may all be included in one or other of the following hypotheses, the first and most recent of which is that hydatid moles are necessarily connected with impregnation, and are the result of embryonic death and morbid growth of some portion of the ovum. The second is that hydatid moles are not connected with pregnancy at all, but are simply the result of diseased ovarian action. The last, and, perhaps, the oldest of the theories referred to, is that these vesicular uterine masses are similar in their structure and development to the true hydatids found in other parts of the body. A full and interesting account of the opinions of the ancient writers on midwifery on this subject may be found in Crooke's *Μικροεμοτραφία*, published in 1651. And as that work is not very commonly met with at the present day, I regret that the space at my disposal only suffices for a few lines of quotation from this very curious volume. "To perfect conception," says our author, "there is further required an *εὐκρασία* or laudable temper of the womb: for those whose wombs are either hot or cold, or moist or dry above measure, does not conceive, as saith Hippocrates. If, therefore, any of these things be wanting we cannot hope for a lawful conception, but either there will be none at all, or a depraved and vicious, such as is of the moon calf or *molla*. For Nature rather endeavoureth an imperfect and depraved conception than none at all, because she is greedy of propagation, and diligent to maintain the perpetuity of the kind of things: whereupon, rather than she will do nothing, she will endeavour anything how imperfect soever."[a] One of the most interesting "Exercitations," in "Harvey's Treatise on Genera-

[a] *Μικροεμοτραφία*. A Description of the Body of Man, together with the Controversies and Figures thereunto belonging. By Helkiah Crooke, Doctor in Physicke, Physitian to His Majesty. Folio. London: 1651, p. 219.

tion," is that in which mention is made of this subject. Harvey observed that these substances are usually expelled in the early stage of the supposed pregnancy, and his ideas on the point appear to coincide with those of Hippocrates generally.

Hippocrates, describing the ill effects of drinking marsh water, in the treatise "On Airs, Waters, and Places," mentions amongst them the following:—"And further, the woman appears to be with child, and when the period of parturition arrives the fulness of the belly disappears, and this happens from dropsy of the uterus." Dr. Adams, in his learned commentary on the works of Hippocrates, referring to the foregoing passage, says:—It may appear singular that hydatids of the womb should be peculiarly prevalent in the case of women that drink unwholesome water from marshes, and yet our author's observation is confirmed by a modern authority, as quoted by Coray:—"Il a été également prouvé par les observations des modernes, que les fausses grossesses produites par les hydatids sont très-communes dans les pays marécageux ou la plupart des habitans ont une constitution lâche, propre à l'affection scorbutique qui y est presque endémique, qu'elles se terminent plus ou moins tard par l'excretion de ces hydatids." [b]

Most modern writers on midwifery assert that these uterine hydatids are invariably dependant on impregnation. The late Dr. Montgomery, in his work on the "Signs of Pregnancy," says:—"My own belief then is that uterine hydatids do not occur except after sexual intercourse, and as a consequence of impregnation; never having met or heard of a case in which their presence was not accompanied or preceded by the usual symptoms of pregnancy. Still it must be confessed that our knowledge on this point is by no means sufficiently precise, nor our collection of facts sufficiently extended to warrant us in pronouncing positively on the question, or asserting decidedly in a case of suspicion that a woman was pregnant merely because she discharged hydatids from the uterus." [c] Dr. M'Clintock bears still stronger testimony to the same effect. He says:—"In every example of the disease which has fallen within my own observation, or came within the sphere of my knowledge, the history and symptoms, and the anatomical appearance of the ejected mass all justified the conclusion that the disease supervened upon

[a] Harvey "On Generation." Exercitation the 56th, p. 420. Edition of 1653.

[b] Hippocrates Translated, with Annotations. By Francis Adams, LL.D. Sydenham Society edition, Vol. i., p. 197. London: 1849.

[c] Dr. Montgomery "On the Signs of Pregnancy," p. 264. 2nd edition.

impregnation."[a] Lamzweerde asserts that "Virgines non possunt concipere vel generare molam sine copula maris." The same author also declares that "Vidua non potest concipere molam virtute mariti defuncti relicta in utero, sine novo maris auxilio"[b] Madame Bovin states that these moles are degenerated ova, and that they are always the result of impregnation.[c] Dr. Campbell, in his "Midwifery," says that, "except in one case related to him by one of his pupils, the author never heard of a case in which hydatids of the uterus were produced by an unmarried female, but always by persons in constant intercourse with their husbands."[d]

Mr. Paget, in his "Lectures on Surgical Pathology," has given a very clear account of the pathology of this disease, which he terms "cystic disease of the chorion."[e] In his views on this subject Mr. Paget coincides with Dr. Mettenheimer, who holds that these cysts are merely enlarged "chorion villi deviating from their cell form, and increasing disproportionately in size out of each of which a new vegetation of villi sprouts of the same structure, with the proper villi of the chorion."[f] Dr. M'Clintock, whose experience of this disease is, I believe, larger than that of any other writer, concurs with Mr. Paget's opinion, and adopts his phraseology on this topic:—"As," he thinks, "this most truly expresses the pathological nature of the complaint."[g] Dr. Carl Weld says:—"These serous degenerations of the villi are still more remarkable when they occur at an earlier stage of the formation of the chorion, in which case they are generally connected with a complete dissolution of the fetus. . . . We regard," he adds, "these as immature, newly developed elements of connective tissue."[h]

Dr. Graily Hewitt says:—"The little vesicular bodies expelled singly from the uterus, or in series like beads, really result from

[a] Dr. M'Clintock—"Clinical Memoirs on the Diseases of Women," p. 397. Dublin: 1863.

[b] Lamzweerde—"Historia Naturalis Molarum Uteri," pp. 171-176. 1685.

[c] Madame Bovin—"Traité Pratique des Maladies de l'Uterus, &c.," Tome i., pp. 288-293. Paris, 1833.

[d] Dr. Campbell—"Introduction to the Study of Midwifery," p. 450. Edinburgh: 1833.

[e] Mr. Paget—"Lectures on Surgical Pathology," pp. 417-420. London: 1863.

[f] Dr. Mettenheimer—"On Cystic Disease of the Ovum." In Muller's Archiv. H. 5, p. 417.

[g] Dr. M'Clintock—"Clinical Memoirs on Diseases of Women," pp. 393-410. Dublin: 1863.

[h] Dr. Carl Weld—"Pathological Histology," p. 174. London: 1855.

certain alterations in the chorion villi, and are always the result of conception." Dr. Hewitt also maintains that in such cases the fetus dies first, and that then the chorion villi becoming altered, and not merely arrested in their development, the result is the formation of the so-called hydatidiform or vesicular mole.[a] Dr. Koeberle sustains this theory in a paper published about the same time as Dr. Graily Hewitt's memoir. Dr. Koeberle treats of the disease under the term of "internal abortion of the fetus," by which he means "the death of the fetus in utero at any period of pregnancy while its coverings continue to grow, and the fetus itself degenerates, or is mummified."[b] Dr. Braxton Hicks considers that the formation of hydatidiform masses in the uterus depends on a continuation of the growth of the villi after the normal type, and is not due to any superadded impulse, as is implied in the term "proliferous cyst."[c] Dr. Churchill says:—"There may be a form of hydatids not the result of impregnation, yet in the majority of cases it is probable that moles, properly so called, whether blighted conceptions, fleshy moles, or hydatids, are truly consequent upon sexual intercourse and impregnation; but in the practical application of this judgment to forensic medicine, we must not forget that this does not imply criminality or impropriety in every case; as, for instance, a widow may have conceived during the lifetime of her husband, and the death of the embryo not having been followed by the expulsion of the ovum, it may remain in utero until after the death of the husband, and then be discharged, without the slightest suspicion attaching itself to her conduct."[d]

A theory has been put forward by Dr. Graily Hewitt,[e] and sustained by Dr. J. Byrne[f] and other recent writers, to the effect that in cases of hydatidiform disease of the ovum, "If the death of the fetus be postponed until the formation of the fetal placenta has commenced, the hydatidiform degeneration will be necessarily limited to that part of the chorion which is in contact with the decidua serotina." Now this conjecture is, in fact, a revival of the old opinion that uterine hydatids are formed in the placental

[a] Dr. Graily Hewitt—On Diseases of Women, p. 74. London: 1863. And also in Obstetrical Transactions, Vol. i., p. 249. London: 1859.

[b] Dr. Koeberle—In Presse Med., 1858, p. 45. And Sydenham Soc. Year Book, 1859, p. 353.

[c] Dr. Braxton Hicks in Guy's Hospital Reports, 1865.

[d] Dr. Churchill "On Diseases of Women," page 284. Dublin, 1864.

[e] Dr. Graily Hewitt in Transactions of London Obstetrical Society.

[f] Dr. J. Byrne in Dublin Quarterly Journal of Medical Science, 1865, p. 464.

ubstance. Thus Ruysch, the celebrated Dutch anatomist of the 17th century, speaks of uterine hydatids originating in the placental structure:—Hæc recenta moles placentæ, penitus amittens genuinam suam indolem, quia est vasorum sanguineorum contextus, integro suo corpore mutatur in congeriem hydatidum.[a] Dr. Denman says:—"These (hydatids) have been supposed to proceed from coagula of blood, or portions of the placenta remaining in the uterus: and the opinion is generally true; but there is sometimes reason for thinking that they are an original production of the uterus, independent of such accidental circumstances, and sometimes the precursors of organic disease in that part."[b]

In Dr. Wm. Hunter's lectures on the gravid uterus, delivered in 1765, and cited by Dr. Davis, the following mention is made of hydatid disease of the uterus:—"I have seen a placenta in the fourth month all degenerating into hydatids. There are two kinds, one where the little hydatids are distinct and detached, the other where they hang together in things like bunches of currants. This last sort is the most common in the uterus. They are most common in the placenta, but they may be in other parts of the uterus. Sometimes there are vast heaps of them in the cavity of the uterus, and no remains of the placenta. I ventured, from seeing hydatids coming away from the uterus, to say that the woman was with child, because they most commonly attended the placenta. I have seen pailfuls of hydatids come away from the uterus with pains, the placenta and fetus being thus converted. They are generally the accompaniments, as also probably the results, of blighted and other diseased forms of eventually unproductive gestation."[c]

Hydatidiform disease of the placenta is spoken of by Sir Edward Home, who regards it as a not uncommon cause of miscarriage—"For," he says, "when it takes place the natural healthy actions for the support of the fetus are so much impeded that its growth is arrested. This evidently happened in a case published, with an engraving of the placenta and fetus, by Dr. Denman; and when the patient does not early miscarry the fetus disappears, and in all the instances in which miscarriage has taken place in a more

[a] Ruysch (Frederici)—Thesaurus Anatomicus. Pars. Secundus, Tom. Primus, p. 47. Amstelodami: 1710.

[b] Denman—"Introduction to the Practice of Midwifery," Vol. i., p. 117. London: 1805.

[c] Dr. Davis—"Obstetric Medicine," p. 676.

advanced stage of pregnancy, I believe no fetus has been found."[a]

Dr. Burns says:—"In a great majority of cases hydatids are found in the placenta of a blighted ovum, and accordingly the symptoms at first are exactly the same with those of pregnancy."[b] Dr. Blundell says:—"Hydatids sometimes form in the ovum and (if I may be allowed the expression) devour it; sometimes a part only being converted into their substance, so that they lie embedded and concealed in the placentar structure; sometimes the whole, or with the exception of a few vestiges being consumed, so that in place of the ovum nothing but these animalcules remains in the uterus."[c]

To explain the production of uterine hydatids by the assertion that they are merely enlargements or distentions of serous or mucous follicles, is, I fear, but to explain *ignotum per ignotius*, leaving the matter in its original obscurity. Under conditions of healthy nutrition we know that the animal fluids tend to resolve themselves into organized structures, but under conditions of unhealthy nutrition or assimilation the property inherent in the nutritive fluids, by which they tend to form organized structures analogous in character to the part in which they are deposited, is suspended, and, the principle of organization still existing, the result is the formation of heterologous structures, that is, of tissues essentially different from those which would be formed in the same part by healthy vital action. Thus structures are formed either of a malignant character, such as cancer or tubercle, or of a low organization, as in the case of the hydatidiform masses which are occasionally formed in the uterus.

The theory that hydatidiform moles of the uterus are formed by the degeneration of transformed chorion villi of a blighted fetus, although it may be applicable to many cases, is, I think, clearly disproved (as a universal law) by the numerous cases on record in which uterine hydatids were expelled by unmarried women whose chastity was unimpeachable. I therefore think it by no means improbable that some of these instances might be accounted for on the supposition that a morbid action or monstrous growth may occur

[a] Home—"In Transactions of a Society for Improving Medical and Chirurgical Knowledge," Vol. ii., p. 300.

[b] Burns—"Principles of Midwifery," p. 135, 10th edition. London : 1843.

[c] Blundell's "Principles and Practice of Obstetric Medicine." Edited by Drs. Lee and Rogers, p. 250.

in one of the Graafian vesicles, which modern physiology has shown are discharged from the ovaries at each menstrual period, and that this hydatidiform disease of the unimpregnated ovum may be in some way connected with ovarian disease.

Dr. Samuel Ashwell, in his treatise "On the Diseases of Women," speaking of the vesicular mole of the uterus, says:—"I have seen, at least, one example where they were the result of diseased action of the uterine lining membrane, independently of sexual intercourse. The patient was the widow of a surgeon, and of undoubted reputation. Her husband had been dead two years and a half, when the abdomen began to enlarge. She had nausea, but no vomiting, from which she had always suffered in her pregnancies. The increase of size was very rapid, and at three months and a half from the first stoppages of menstruation, the bulk of the uterus had reached that of a seven months' pregnancy. The abdominal tumour was flaccid, and the os closed. At the fourth month after more than ordinary exertion there was a gush of blood from the vagina, followed by the immediate escape of a considerable quantity of vesicular hydatids. The recovery was good. Iron was afterwards given. She was sent to the sea-side, and now, at the expiration of several years, there has been no return of the malady. Mr. Douglas Fox, Surgeon to the Derbyshire Infirmary, gave me the particulars of a case in which a large mass of vesicular hydatids was expelled from the uterus of a maiden lady, where the hymen was unruptured, and of whose chastity there could not be a suspicion."[a]

The following very suggestive case is recorded by Dr. Graily Hewitt:—"A young unmarried woman died with excessive enlargement of the abdomen, and on examination it proved the peritoneal cavity was beset with true hydatid cysts, which had originated primarily in the liver. These hydatid cysts were found attached to the uterus anteriorly as well as posteriorly, to the ovaries, to the walls of the pelvis—in fact, few portions of the peritoneal surface were without them. Had life been prolonged, the bursting of some of these cysts into the uterus, or into the vagina, was almost inevitable, and then the phenomena would have been presented of a young unmarried woman discharging true hydatids from the generative passages."

Dr. William Ashley, in his valuable essay on this subject,

[a] A Practical Treatise on the Diseases Peculiar to Women. By Samuel Ashwell, M.D., p. 528. London: 1844.

speaking of the pathogeny of the uterine hydatid mole, says:—"In a case that came under my care there was strong presumptive evidence that it had established itself on the 'debris' of retained placenta; symptoms of hydatid formation appeared a few weeks after delivery, and under circumstances which precluded the possibility of a subsequent impregnation."[a] The same author also cites another case of vesicular mole of the uterus, which appears to have been in no way connected with pregnancy, related by Dr. Knoch, of Heilgenbeil:—"A healthy, strong woman, thirty-two years of age, had been married nine years, and had borne four children without difficulty. At this time she was living apart from her husband, so that according to the declaration of both there could have been no intercourse. The menstrual function ceased after the weaning of the last child, and the patient observed that her abdomen became enlarged, as if she were again pregnant. After three months' suffering, during which she was continually upbraided by her husband in consequence of her condition, pains came on, and hydatids about the size of two fists were extruded. They were collected in a grape-like cluster, and the cysts varied in size from a hemp-seed to that of a walnut."[b]

In the *Annales D'Hygiene* for April, 1867, the following case is related by Dr. Fischer:—A young woman, pluripara, delivered herself in a wood, threw the infant—born alive—and afterbirth, into a stream, and returned to a poorhouse. Two months later she passed a mass of hydatidinous placenta. At the base of the mass was a fleshy membranous substance. Near the point of the ovum was a vesicle the size of a grain of coffee, quite different from the hydatids, attached to the walls of the ovum by a whitish cord. This vesicle was considered to be the umbilical vesicle of an ovum that had disappeared. In this case there had been a twin-pregnancy; one of the embryos had died, and the ovum had been transformed into a hydatid mole, too adherent to the walls of the uterus to be expelled at the time of labour of the living child. If this explanation be not admitted, says Dr. Fischer, it must be concluded that true superfetation, or an impregnation subsequent to the labour, had taken place. As the woman was in custody the latter event was impossible.

A few words as to the old theory, which was supported by Linnæus and other not less eminent writers of that time, namely,

[a] Dr. Ashley—"On Vesicular Hydatids of the Uterus." London: 1856, p. 21.
[b] Ibid, p. 27.

that these uterine hydatidiform growths are identical with the true hydatids or acephalocysts found in other parts of the body. This conjecture is now abandoned by all modern writers on the subject; still there are some points in which the two diseases present considerable similarity, and, moreover, ordinary hydatids or acephalocysts, apparently possessing independent animal organization and vitality, have been found in the uterus. It must be admitted that the closest resemblance exists between hydatids and the primary nucleated cell formation of all organized structures, and it has been maintained that hydatids are nothing more than nucleated cells "rendered gigantic and monstrous by some erring or morbid action of the vital forces." But which ever of these theories be right, those who support either view have done little more than assert their own opinion, the question being one which the means of investigation at our command do not afford us the power of solving. The chief points of difference between the so-called "true hydatids" and those hydatidiform growths found in the uterus are, that the latter are generally found in aggregated masses, the several vesicles being united to each other by a common central stalk, to which they are attached by narrow pedicles, presenting an appearance somewhat similar to a bunch of white grapes hanging from its stalk; while the former exist as separate vesicular bodies, each of which is supposed to possess independent vitality. Moreover, the true hydatid cyst is commonly of a dense laminated structure, while the uterine hydatidiform growths are not contained within a parent cyst, and their capsule is of a remarkably thin membranous formation.

The particulars of a very interesting case of true hydatids found in the substance of the uterus were published in the *Lancet* several years ago by Mr. Wilton, Surgeon to the Brighton Lying-in Institution:—"The patient was a woman aged thirty-seven, the mother of four children. She was admitted into hospital, suffering from uterine hemorrhage and bearing down pains. She died four days afterwards, and on examination the veins of the fundus were found varicose and congested; a large mass of hydatids was found protruding into the cavity of the uterus, and a large cluster, equal in size to a small tea cup, was firmly adherent to the fundus. The lining membrane in the diseased part was entirely absent, and the masses of hydatids were firmly imbedded in the structure of the uterus, the vessels being dissected into layers by them. Other masses were found between the mucous membrane and the structure

of the uterus, and also in the right ovary, the substance of which was thus disorganized."[a]

It would, I think, be unprofitable to pursue this review of the various opinions which have been held at different times on this subject any further. The theory most generally adopted at present is, that hydatidiform moles differ from true hydatids in being the pathological degeneration or abnormal development of some one of the embryonic structures already existing in the uterus, and not independent organisms as the latter are. But, as I have already shown, there are many cases of hydatidiform mole of the uterus to which this theory does not apply. If, then, uterine hydatids sometimes occur under circumstances which prevent the possibility of their being connected with degeneration or abnormal development of any of the embryonic tissues—that is, in cases in which pregnancy has never existed—in what light, under these circumstances, are we to regard the occurrence of hydatidiform growths within the uterus? The answer to this is, I think, that we must look for the solution of this *questio vexata*, in such cases, either to those constitutional changes which lead to the formation of true hydatids in other parts of the body, or else to morbid action set up within the ovary of an unimpregnated female, and which results in the production of hydatidiform disease in a Graafian vesicle, and of its escape from the ovary into the uterine cavity, where it continues to increase in bulk, until it excites uterine irritation and expulsive action. The symptoms occasioned by hydatidiform disease in the uterus are extremely obscure, being chiefly those produced by the presence of the hydatidiform growths acting as foreign bodies, giving rise to irritation of the uterus, and leading to their expulsion therefrom.

The diagnosis of hydatids of the uterus is, indeed, very difficult, and in the early months it would be almost impossible to distinguish with certainty between this condition and ordinary pregnancy. If, however, in a case of supposed pregnancy there be no movement of the fetus after the fourth month, together with an absence of the sounds of the fetal heart, if ballottement cannot be practised after this period, if the morning sickness suddenly cease at an earlier period of gestation than is customary, if there be rigors, followed by a flaccid condition of the mammæ, a sense of a peculiar weight in the uterus, and an irregular enlargement and hardness of

[a] Mr. Wilton—In Lancet, February 1st, 1840, p. 590.

that organ—we may suspect that some pathological change has occurred in the ovum consequent on the death of the fetus. But we cannot pronounce with certainty any opinion on the nature of the pathological change which has taken place until the expulsion of the uterine contents, unless, indeed, as is often the case when hydatids are present, there are occasional discharges of water, or reddish serum, together with hemorrhage from the uterus in a case of supposed pregnancy.

The diagnosis between pregnancy and uterine hydatids may be a matter of great importance, involving the reputation of the patient. Dr. Hamilton in his lectures mentions a case in which a serious mistake of this kind was made by the most eminent physician of his time, the celebrated Dr. Cullen, who, during the absence of Dr. Hamilton's father, was called in to attend one of his patients who was suddenly taken ill, and was pronounced by Dr. Cullen to have miscarried. This opinion was unfortunately the cause of destroying the domestic happiness of the lady and her reputation, as she had been living apart from her husband for two years. On Dr. Hamilton's return he examined the mass expelled from the uterus, and at once declared it to consist of hydatids; but this opinion was then too late to restore the lady's character and the confidence of her family.

The expulsion of the hydatidiform mass from the uterus in the first case which I attended occurred in the fifth month of the supposed pregnancy, and it seems a fact worth observation that most cases of this kind take place about the same period. In the four cases of hydatid delivery mentioned by Drs. Sinclair and Johnston, two of the cases occurred at the fourth month, one at the eighth, and the other at the ninth month of pregnancy.[a] Mr. Watson of Warwick, published an admirably illustrated history of a case of this kind in one of the early volumes of the Transactions of the Provincial Medical Association, in which "the uterus before the expulsion of the hydatids occupied a space equal to that of a pregnancy of five or six months."[b] In two cases of this disease related by Dr. Ashwell the patients were both supposed to be about four months pregnant.[c] The same remark applies to a case narrated by

[a] Drs. Sinclair and Johnston's Practical Midwifery, p. 483. London, 1858.

[b] Mr. Watson—"A Case of Uterine Hydatids," in Transactions of Provincial Medical and Surgical Association, Vol. ii., p. 349. London: 1834.

[c] Dr. Samuel Ashwell—Treatise on Diseases of Women, p. 535. London: 1844.

Dr. J. B. Brown.[a] In Drs. M'Clintock and Hardy's case the woman was believed to be four months advanced in her first pregnancy.[b] In the two cases seen by Dr. Meadows "the patients were both supposed to have gone between five and six months."[c] Of the five cases of cystic disease of the ovum, the details of which are given by Dr. M'Clintock, in two the patients were supposed to be four months pregnant; in one to be three and a half months; in one to be two months; and in one to be six months advanced in pregnancy.[d] Dr. Byrne records a case in which the hydatidiform mass was expelled when the woman was believed about four months pregnant.[e] In some cases, however, the hydatids are expelled earlier, as in the case published by Dr. Moorhead, of Weymouth, in which a hydatidiform ovum was produced at about the tenth week by a woman, aged fifty, who had not had a child for twenty years before.[f] In other cases it may be much later, as in my second case, also in the case related by Sir James Simpson, in both of which the patients reckoned themselves gone beyond the full time of utero gestation;[g] and in that given by Mr. Ley, of South Molton, in which the woman was supposed by herself and her medical attendant to have gone her full time of nine months.[h]

In cases of hydatidiform moles of the uterus, the danger of alarming hemorrhage at the time of expulsion from the uterus, is a point generally insisted upon by writers, this was illustrated in the second case, the particulars of which I have described. In Clarke's "Observations on the Diseases of Females," the danger of uterine hemorrhage in such cases is thus spoken of:—"The os uteri is dilated; the hydatids are expelled by periodical pains; and then for the first time danger presents itself in the form of alarming hemorrhage. This hemorrhage is more frightful than that which follows the removal of the placenta from an uncontracted uterus;

[a] Dr. J. B. Brown—In British Record of Obstetric Medicine and Surgery for 1848. Vol. i., p. 21.

[b] Drs. M'Clintock and Hardy—Practical Observations on Midwifery, p. 233. Dublin: 1848.

[c] Dr. Meadows—Manual of Midwifery, p. 75. London: 1862.

[d] Dr. M'Clintock—Clinical Memoirs on Diseases of Women, p. 393-340. Dublin: 18—

[e] Dr. Byrne—In Dublin Quarterly Journal of Medical Science, 1865.

[f] Dr. Moorhead—On a Case of Hydatidiform Ovum, in Lancet, Feb. 21, 1863, p. 202.

[g] Sir James Simpson—"Obstetric Memoirs and Contributions," Vol. ii., p. 450. Edinburgh: 1856.

[h] Mr. Ley—In Medical Times and Gazette, Dec. 2nd, 1866, p. 662.

and the reason is obvious—the placenta covered only a limited space of the internal surface of the uterus, whereas the hydatids spring from every portion of the cavity."[a]

As to the general constitutional treatment of these cases, I do not think that the obstetrician can do much. The fact, however, that these hydatidiform productions generally occur in persons of an enfeebled and cachectic constitution obviously suggests the necessity for improving the condition of the vital fluid by a generous and nutritious regimen, and by the employment of tonic remedies, and especially chalybeates.

With regard to the special uterine treatment proper to be pursued in cases of hydatidiform moles, a very difficult question arises. Some authors lay it down as a rule that once we are satisfied of the existence of hydatid growths in the uterus by the symptoms which I have described, it becomes the duty of the practitioner to encourage the expulsion of the morbid growth, by cautiously dilating the os uteri and stimulating the uterine contractions. Such practice cannot, however, I think, be approved of, when we consider that hydatids may co-exist with natural pregnancy, and the uterus may contain a healthy fetus, which may be born alive at the ordinary period of gestation, although there have at the same time been hydatid growths in the uterus. Dr. Davis, in a paper read before the Obstetrical Society, has recorded the particulars of a case in which a hydatid mole was expelled from the uterus immediately after a living fetus and its placenta, at about six months' gestation, the hydatid growth being attributed by Dr. Davis to the degenerated ovum of a twin conception.[b] Dr. Hildebrandt has also recorded the case of a hydatid mole, together with a normally developed ovum.[c] Cases such as these two last, the number of which could very easily be multiplied, are sufficient to demonstrate the impropriety and danger of the rule to which I have above referred. Far better would it be to let nature take its course in every case of hydatidiform mole, for in due course the morbid growth will be surely expelled from the uterus, than by unnecessary interference run the grave risk of destroying a living fetus.

[a] Observations on the Diseases of Females. By Charles Mansfield Clarke, M.D. Part II., p. 116.

[b] Dr. J. Hall Davis, in Transactions of the Obstetrical Society of London, 1861, Vol. iii.

[c] Dr. Hildebrandt—Monat. für Geb., September, 1861, p. 224 ; and New Sydenham Society Year Book, 1861.

ART. XIII.—*Observations on Rupture of the Urinary Bladder, with the History of a Case that ended in Recovery, in which the Peritoneal Sac was Washed out with Tepid Water injected through the Rent in the Organ.* By HENLEY THORP, M.D., F.R.C.S.I.; Medical Attendant, Letterkenny Union Infirmary and County Fever Hospital; Consulting and Visiting Physician, Donegal District Lunatic Asylum; formerly Demonstrator of Anatomy, Royal College of Surgeons in Ireland, &c., &c.

RUPTURE of the urinary bladder is an accident so generally fatal that the history of an exceptional recovery is certain to be regarded with no ordinary interest. Out of upwards of fifty cases of this grave injury reported by different surgeons, and scattered through the archives of medical societies and journals, there are but three instances of recovery recorded—one occurred in the practice of the distinguished Surgeon of the Edinburgh Infirmary, Mr. Syme[a]; another was treated in the Meath Hospital, by the late Professor Porter;[b] and the third case is reported by Mr. Chaldecot, of Dorking.[c] In the two first instances referred to the lesion interested the anterior segment of the bladder, or that portion of the viscus uncovered by serous membrane, consequently the urine was extravasated, not into the cavity of the abdomen, but into the connective cellular tissue. In Mr. Chaldecot's case, however, the rupture is supposed to have taken place posteriorly, and although the patient was seen by the late Aston Key, who coincided in the diagnosis, it is to be regretted that any want of precision or incompleteness in the details of the case, should lead to doubts as to its real nature. Mr. Chaldecot, certainly, does not seem to be aware that the bladder is liable to give way in any other position than posteriorly—for, in remarking upon the absence of urine from the organ, after the occurrence of the accident, his words are: "If, therefore, it (the urine) did not escape into the peritoneum what else could have become of it?" In fact, this case has been the cause of a very sharp controversy between two authorities equally competent—one gentleman being sceptical as to whether the

[a] Contributions to Pathology and Practical Surgery, 8vo, 1848, p. 332.
[b] Rynd's Practical Observations on Stricture, p. 48.
[c] Provincial Medical and Surgical Journal, 1846, p. 333.

bladder was really ruptured.[a] That gunshot and other penetrating wounds of the bladder are not necessarily fatal is well understood—still eminent authorities might be cited who doubt the possibility of recovery from ruptured bladder with extravasation of urine into the the peritoneal sac. The following case, however, which has recently occurred in my practice, was seen by two other surgeons, and watched throughout with great interest and anxiety, places the question beyond dispute.

On the night of Friday, 28th February last, J. M'Auley, aged thirty, a respectable farmer, of sound constitution, sanguine temperament, and active habits, was thrown from his horse. Being intoxicated at the time of the accident, he could give no satisfactory account of the mode of its occurrence. The horse galloped home riderless—suspicions arose—a search was instituted, and shortly afterwards his owner, in a state of insensibility, was discovered on the road-side, about half a mile distant. In some 20 or 30 minutes consciousness returned. He then experienced a severe pain at the bottom of his belly, attended with an urgent desire to pass water, but no power of emptying the bladder. On visiting the patient four hours subsequently, I found him in a sitting posture, with his body bent forwards. He complained of an oppressive burning pain in the hypogastric region—there was a pressing inclination without the capacity to micturate—the abdominal muscles, more especially the recti, were rigid and tense, and any attempt to stand upright produced a great increase of suffering. He had neither vomiting nor rigor—nor did the surface of the belly present any contusion or other mark of injury. A full-sized gum elastic catheter entered the bladder without difficulty. At first no fluid escaped; but, upon pushing the instrument onwards, and at the same time turning it a little on its axis, about a tablespoonful of bloody urine flowed out. No further quantity coming away, I withdrew the catheter a short distance, twisted it round in another direction, and again passed it backwards, when an additional ounce of a reddish fluid welled over, without force or jet. By changing the position of the patient from side to side—turning him over upon his knees, and substituting a silver for the gum elastic instrument, I at length

[a] Glasgow Medical Journal, No. XXVI., July, 1859, p. 168.

[In this place I beg to offer my best thanks to Dr. F. D. Weisse, an American Physician, with whom I have not the pleasure of being personally acquainted, but who, hearing accidentally of the case that forms the subject of the present communication, kindly directed my attention, through Surgeon George Porter, to the controversy above referred to.]

succeeded in obtaining nearly half a pint of urine, mixed with blood. The patient expressed himself as much relieved; and, having placed him in a half sitting posture, with his shoulders well raised, I administered a teaspoonful of laudanum in a glass of water, and again introduced the gum elastic catheter—pushing its extremity not further than the cervix vesicæ, and when a few drops of clear urine distilled over, it was fixed in this position. I left the patient, but returned in a few hours—having in the meanwhile provided myself with a half-pint elastic bottle and stop-cock—and found him still complaining of the burning pain in the belly, although not so severe as at my previous visit. He had not slept during my absence, but the distressing desire to pass water had passed off. The instrument had retained its position, and a drop of clear urine escaped at intervals from its extremity. Withdrawing the gum elastic, I now introduced a silver catheter into the bladder. The organ felt contracted, and did not easily admit of the complete introduction of the instrument, nor could the latter be depressed, pushed onwards, or moved about with the same ease as previously. Furthermore, the manipulations caused much pain; and, accordingly, the gum elastic catheter, now mounted upon a strong stilet, shaped like a sound, was again passed into the bladder; its movements, likewise, were at first restricted and painful, until after cautiously probing and turning its point, it entered nearly its full length, when a different feeling of resistance was communicated, and it could be moved about with somewhat greater freedom. The stilet being withdrawn, a tablespoonful of reddish urine flowed away. The stop-cock of the elastic bag was next adjusted to the catheter, and tepid water, to the amount of three bagfuls, injected through the instrument. Each portion when introduced was retained for a couple of minutes, and then allowed to return through the catheter, so that not more than eight ounces were injected at a time into the abdominal cavity. At first the water returned of a reddish tinge, but the last half pint was clear and bloodless. Each bagful regurgitated in a slow and interrupted manner, and pressure had no influence in accelerating or otherwise altering the mode of its discharge. During these proceedings, which occupied about twenty minutes, the patient was caused frequently to change his position, so as to mix the injected fluid as much as possible with whatever urine remained in the peritoneal sac. As soon as the abdomen was emptied as far as practicable, the patient was again placed upon his back, with the

pelvis well depressed, and the catheter withdrawn partially—that is to say, until its extremity only projected into the bladder; and when the urine commenced to drop away, the instrument was securely fixed with a proper jugum. Ordered 40 leeches to the lower part of the abdomen; when the leeches drop off, a warm bath for 30 minutes; afterwards, a bran poultice; one grain of opium and half a grain of calomel every second hour. Diet to consist of bread and milk, corn-flour pudding, arrow-root, rice, gruel, and barley water.

Sunday morning.—Patient is free from pain; countenance, good. He has had no rigor; abdominal wall continues rigid and resisting; some tenderness of the hypogastrium when firm pressure is made thereon, but no distension; pulse quiet and natural—86; urine escapes *guttatim* through the catheter. Ordered—24 more leeches, to be applied to the belly; pills and bran poultice to be continued. At this visit I had the advantage of consulting with Dr. G. Elliott, who kindly accompanied me to see the patient.

Was sent for hurriedly on Sunday night, or, rather, Monday morning, at four o'clock, a.m. The catheter had escaped from the patient's bladder during sleep. He awoke, suffering some pain, and had a slight rigor. Pulse, 90. I re-introduced the instrument, and directed another dozen of leeches to be applied. Continue pills. These latter had not been taken for some hours, the patient being asleep.

Monday afternoon.—Going on well; no pain. Pulse 86, and soft. Catheter retains its place, and is acting satisfactorily.

Tuesday, 10 o'clock, a.m.—The instrument again escaped from the patient's bladder during sleep. Nevertheless, after awakening, he passed, without difficulty or pain, a wine glassful of urine. No change in other respects. The catheter was again introduced and carefully adjusted. And as the patient, while sleeping, unconsciously tampered with it, precautions were taken to prevent him repeating the practice. Another dozen of leeches to be applied over the hypogastrium, where some tenderness continues, although the muscles are less tense and the abdomen softer. The pills are taken regularly and the bran poultice kept on constantly.

Wednesday morning.—Patient slept well during the early part of last night, but awoke in the morning with a severe pain extending over the entire abdomen, which is tense, tender to pressure, and distended at its upper part. His countenance is greatly altered for the worse, and bespeaks much suffering; he had a

shivering during the night. The pain, although constant, has exacerbations of greater intensity coming on at intervals, which the patient attributes to what he calls the "working of the intestines." Pulse 96, small. An emolient enema brought away a scanty hard motion. The evacuation was attended with much relief. Apply a mustard cataplasm over the whole abdomen, and smear it afterwards with half an ounce of mercurial ointment. Continue the bran poultice.

Thursday.—Countenance still much depressed. Abdomen, although less painful, remains tense, and tender to pressure; pulse 90, unsteady, with an intermission; nausea and thirst are present. Patient's gums exhibit a diphtheritic appearance, and there is a slight mercurial fetor. Bowels moved at 5 o'clock, a.m.; motion natural. Has not taken the pills for six hours. To have effervescing draughts every third hour, and two grains of grey powder and one of opium every second hour.

Friday, March 6th.—Patient is rather improved since yesterday; salivation fairly established; mouth sore; abdomen less swollen, but still tender to pressure, more especially in the iliac regions. Pulse 86. Apply again the mustard cataplasm; stop pills with mercury and chalk; one grain of opium every second hour. On this day Dr. Carre, of Ramelton, accompanied me to examine the case and see the patient.

Monday, 9th.—Since last report the patient has progressed most favourably. He has no pain, and the abdomen is soft and compressible. He takes, when awake, the grain of opium every second hour; nevertheless his bowels are moved once daily, and the dejections are natural. He omitted the bran poultice for a day, but some pain and uneasiness returning he re-applied it with complete relief to these symptoms. The constant retention of the catheter having occasioned a purulent discharge from the urethra, the patient, possessing sufficient dexterity, was permitted to introduce the instrument for himself at short intervals. The farinaceous diet prescribed in the first instance has not been deviated from up to this date. To-day he is allowed chicken broth.

March 12th.—Catheter to be dispensed with. The patient has now the power of retaining his urine for several hours without inconvenience, and of emptying his bladder without difficulty. At this date, also, the opium pills and all other medicines were discontinued. He was allowed animal food, and permitted to leave his bed and walk about.

On the 15th the patient complained of severe pain in the calf of left leg, which was swollen and tender, without, however, redness or erythema; and on the 16th there was also tenderness in the groin, and along the course of the saphena vein. Rest for a few days in the horizontal posture, with stuping, relieved those symptoms, and on the 21st he was again able to be up and to take gentle exercise. By the end of the month he had no symptom of the injury remaining, save that he was obliged to rise sometimes twice in the night to make water. His appetite was good, and his strength, which had been greatly reduced, was fast returning. His convalescence is now complete. He enjoys excellent health. Has no vesical irritation whatever, and is able to retain his urine for the normal period.

Since the publication of the late Dr. Harrison's "Memoir on Rupture of the Urinary Bladder,"[a] upwards of thirty years ago, in the pages of this Journal, it may be truly stated that no advance whatever has been made in regard either to the pathology, diagnosis, or treatment of this fatal accident. No doubt cases have been reported from time to time by various practitioners at home and abroad, in which are detailed the appearances found at numerous *post mortems;* and papers, some of them of great interest, have been read and discussed at scientific societies, exclusive of the chapters on the subject to be found in several class-books compiled by the most distinguished surgeons of the day; nevertheless, nothing has been really added to our knowledge of the injury over and above what is contained in the admirable treatise referred to. The case of M'Auley, just detailed, derives its interest not from any peculiarity in its history or symptoms, but because of the singular fact of the patient's recovery, and that a practice not hitherto adopted had been employed to remove the urine from the abdominal cavity. Save and except in its termination, it is a repetition of the tale so often told by others concerning the accident. The man was thrown from his horse in a state of intoxication, but whether the bladder was ruptured from a general concussion of the body (as in a case given by the late Mr. Cusack[b]), or from direct violence applied to the hypogastric region, cannot be determined; nor could I ascertain the state of the viscus in regard to its distension at the time of the accident, as the patient was totally oblivious as to when he had previously passed water

[a] Dublin Medical Journal, Vol. ix., July 1st, 1863.

[b] Dublin Hospital Reports, Vol. ii., p. 312.

However, I am inclined to believe that the organ was not very full when the laceration took place, because at first, with the greatest trouble and care, I could only obtain about eight ounces of bloody urine, and I do not believe that, subsequently, I was enabled to displace much more from the abdomen by the injection of tepid water. Nor does the condition of absolute distension appear to be a *sine qua non* of rupture. In the "Transactions of the Pathological Society" of London, Mr. Prescott Hewitt details an interesting series of cases (ten in number), in one of which an ounce of fluid only was found in the peritoneal cavity after death; "and yet the rent in the bladder was large enough to admit of the passage of the two first fingers." In regard to this case, also, a singular circumstance is mentioned: "that there was no trace of inflammatory action about the serous membrane."

The diagnosis of the accident in M'Auley's case was exceedingly simple. The position of the patient in the sitting posture, with his body bent forward, the spastic rigidity of the abdominal muscles, and the urgent but unavailing efforts to pass water, enabled me to predicate the mischief before I introduced the catheter. Then the empty state of the organ, and the mode the bloody urine overflowed the instrument, without impetus, in small quantities at a time, irregularly and interruptedly, uninfluenced by pressure above the pubes, but clearly affected by pushing the instrument backwards, changing its direction, turning it on its axis, &c., as also by the postural expedients described, placed the nature of the case beyond the possibility of doubt. However, it is not every case of ruptured bladder that presents features so palpable and undisguised. One of the most remarkable facts in relation to this lesion is the tolerance occasionally manifested, and the power of locomotion for hours, even days, possessed by some of the sufferers whose histories are recorded. Mr. Hind[a] relates the case of a bricklayer who was knocked down and run over by a cab. He walked from Lambeth to Pimlico, a distance of two miles, and died three days afterwards. On opening the abdomen the bladder was found small and contracted, with an oblique fissure an inch and a half long in the posterior inferior part, and opening into the peritoneal cavity. But the most extraordinary instance is that given by Harrison.[b]

A man engaged in a scuffle on a Saturday night had his bladder

[a] Medical Society of London. [b] Loc. cit.

ruptured by his opponent falling across the lower part of his abdomen. On Sunday he eat his breakfast, walked into town (a distance of three miles), had his urine drawn off by a surgeon, and returned in the evening. On Monday morning he arose at his usual hour, and went to work, drank some whiskey, and had a catheter again introduced in the course of the afternoon. Tuesday morning he felt somewhat better, passed urine at frequent intervals, and walked about part of the day, and it was only on Wednesday that decided symptoms of peritonitis had manifested themselves, and that the nature of the injury was discovered. The patient expired on the eighth day, and on the posterior surface of the bladder was discovered a fissure an inch and a half in length.

Another fact deserves to be specially noticed, as ignorance of it might lead to grievous oversights:—a solution of continuity in the bladder does not necessarily incapacitate the viscus from retaining a portion of its contents, and even discharging them through the urethra. In proof of this proposition several examples might be cited; it will be sufficient, however, to give one other which occurred in the practice of Dr. Jos. Grueber, of Vienna.[a] A man, aged thirty-two, previously in good health, retired to bed, having drank an unusual quantity of spirituous liquor. He awoke in the middle of the night with an urgent desire to pass water, and in attempting to descend from a two-story-high bed, fell from a height of about six feet, his belly striking against the edge of a wooden box. Although he felt pain in the abdomen, he was able *to rise and to pass urine without difficulty*. The patient died after eighty hours' suffering, and the *post mortem* was made by Professor Rokitansky. A laceration of an inch and a half in length was found in the posterior wall and summit of the bladder, a little to the right side, below which was a second tear, involving, however, only the mucous and muscular coat.[b] It is clear, therefore, that certain cases of ruptured

[a] Dublin Hospital Gazette, Vol. v., p. 263.

[b] Simple rupture of the bladder, produced by a fall or a blow on the hypogastric region, or a general concussion of the body, and uncomplicated by fracture of the pelvic bones, solution of continuity in the abdominal walls, gun-shot injuries, &c. (and it is to simple rupture that the observations contained in this contribution particularly apply), takes place, as is generally known, most commonly in the posterior wall, and the explanation of the fact given by Dr. Harrison has never been questioned:—"The several tunics of the bladder admit of considerable distension, but least of all the peritoneal; when, therefore, the bladder becomes fully distended, and is then subjected to any violent or sudden compressing force, this tunic, which is then tense and comparatively unyielding, will crack, while the subjacent tunics, which are connected to it, will be torn along with it, whereas, in other situations, where cellular tissue occupies the

bladder are liable to betray practitioners into serious diagnostic errors, and the injury may be overlooked, or mistaken for retention or suppression of urine, injury of the kidney or urethra, peritonitis or enteritis, and that such mistakes have happened is unquestionable. "I once found," says Dr. Harrison, "the urinary bladder ruptured, with peritonitis, in a case in which it was not suspected, the patient having been treated as labouring under fever."

Of no less practical moment is the advantage of establishing a differential diagnosis between cases of ruptured bladder, with discharge of urine into the peritoneal sac, from those rarer instances in which the organ gives way anteriorly, or where it is uncovered by serous membrane. The consequences and the treatment of the two lesions are totally different. In one case the irritation caused by a fluid loaded with effete salts and prone to decomposition, sooner or later excites peritonitis. In the other the effused urine produces destructive cellulitis with gangrenous mischief and fever of a typhoid character. Can we, then, soon after the accident, and with a view to subsequent treatment, diagnosticate with certainty the situation of the rent, with reference to the line of reflection of the serous investment off the posterior segment of the organ? In the majority of cases, when the urine is extravasated into the abdominal cavity, I believe the diagnosis can be made with unerring decision. The manner in which the urine overflows the catheter without impetus or jet, and the fact of our being able to obtain it in *quantity*, by skilful catheterism, are conclusive proofs of its discharge not from the cavity of the bladder, yet of its being free or unconfined—and, therefore, that it comes from the peritoneal sac. If, on the other hand, having a clear history of the case before us—being certain, in fact, that the bladder had previously contained a quantity of urine—the catheter failed to discharge this fluid, or only gave exit to a *small quantity on its first introduction*, there are then good grounds for concluding that the urine was not free, but confined in the cells of the areolar tissue, and consequently unable to return into the bladder through the laceration—in short, that the rupture had taken place through the anterior portion of the viscus.

place of the serous membrane, the coats of the bladder will yield considerably before they give way, or admit of laceration." Yet, cases do occur in which the rupture occupies the anterior wall, where no serous membrane exists. Such was the remarkable case of recovery already referred to, as given by Syme; and the case quoted in the text, in which a solution of continuity existed posteriorly, *involving the mucous and muscular coats*, but leaving the peritoneal covering intact, may cause some doubts as to the correctness of the explanation given in the paragraph just quoted.

I shall conclude by offering a few observations upon the treatment of this accident. The first indication is obviously to remove, as completely and speedily as possible, the effused urine from the abdominal cavity. The operative measures hitherto proposed for this purpose are three in number:—1. Paracentesis above the pubes. 2. The proposal of opening the belly by an incision along the linea alba—sponging out or otherwise removing the effused urine, and closing the rent in the bladder by interrupted suture. 3. Tapping, or opening by incision the recto-vesical *cul de sac* from the rectum. The first-named operation has been practised twice—first by Bonet,[a] and subsequently by the late Mr. Cusack.[b] In both cases, abdominal fluctuation was distinct. In Bonet's patient, however, blood only flowed through the canula ; but in the instance related by Cusack, "a large quantity of clear urine escaped, and at the same time flowed freely through a catheter introduced into the urethra," with great relief to the patient. Both cases ended fatally. I would strongly recommend the adoption of postural means, in case it be deemed prudent on any future occasion to repeat paracentesis. Let the patient be placed upon his knees, with his shoulders depressed so far as to bring the pelvis into a position above the canula. In this manner, the artificial outlet being at a depending point, both urine and blood could be evacuated from the abdomen. The second proposal mentioned has never been put into practice ; and although the results of ovariotomy and the successful extirpation of the entire uterus and ovaries might encourage a sanguine surgeon to undertake the operation, the majority of the profession will be slow to adopt so bold a measure, while others, less hazardous, offer the slightest prospect of success. The third method of discharging the urine from the abdomen was first propounded by Dr. Harrison. It occurs to me, however, that more difficulty would be encountered in carrying out the plan than he seemed to anticipate. The reflection of the peritoneum from the rectum to the bladder takes place at least three inches and a half from the anus—that is to say, almost beyond the reach of the finger—and a trocar pushed upwards might easily penetrate the small intestines, unless, indeed, a considerable quantity of fluid existed in the cul de sac. And, should a bistoury be preferred, the risk of mischief would not be lessened. To cut upon a staff introduced through the urethra

[a] Sepul. Anat., Lib. 3, Sec. 24, Obs. 12.

[b] Dublin Hospital Reports, 1818, Vol. ii., p. 312.

would be to open the bladder as well as the peritoneal pouch into the rectum ; and if such a wound, supposing it effected the object in view, should be regarded as but a trivial addition to the laceration already existing, incomparable in its immediate beneficial results to its undefined consequences, yet we must recollect the possibility of adhesions existing between the serous surfaces in this locality and of lymphy exudations extending far beyond the limits of the incision, and that such products would be likely to interfere with the free evacuation of the urine from the abdomen, thus rendering the operation altogether futile.

How far the skilful employment of the catheter, postural manœuvres, and the injecting of tepid water or some bland fluid into the peritoneal cavity, through the rent in the organ, may supersede the performance of any of the operations alluded to, must be determined by future experience and observation. I cannot, however, conceal my belief that the practice adopted in the case of M'Auley may not always be easily accomplished. Difficulty may exist in discovering the laceration in the bladder, and uncertainty as to when we have really succeeded in passing an instrument through it, as the flaccid walls of an empty bladder folding themselves round a catheter would closely simulate the impression capable of being conveyed by a loose mass of small intestines. How, then, are we to know when the instrument has really passed through the vesical rent into the abdomen? One certain proof of the position of the instrument was furnished in the case of my patient:—the discharge, in quantity, of a fluid (after the catheter had passed its full distance) differing in physical properties (being red) from that which previously escaped, pellucid and *guttatim*, from the instrument. This fact assured me that I had reached the peritoneal cavity, and the manner the injected water afterwards came away confirmed the correctness of the opinion I had formed.

Next in importance to the primary indication of dislodging, as completely and expeditiously as practicable, the irritant and septic fluid from the belly, is that of preventing a recurrence of the extravasation. This object can only be attained by maintaining the bladder in a condition of complete contraction and emptiness—distension of the organ, even to a moderate extent, must tend to re-open the laceration, disturb its edges, and endanger the integrity of the layer of plastic lymph laid down on its posterior surface. In some of the necropsies recorded, the appearance of this adventitious stratum was very remarkable, lining the pelvis throughout, and

giving a thick coating to the contained viscera; but in a reparative point of view, it is only that portion of the exudation connected with the bladder that concerns us; this, if perfect, and sufficiently consolidated, must act not only as a barrier between the peritoneal sac and the cavity of bladder, but also as an appliance mechanically holding together the edges of the laceration, pending the slower union of the muscular and mucous coats, by which the process of repair is to be definitively accomplished. It is obvious, therefore, that distension of the bladder, or the rude introduction of instruments, must destroy the reparative action that nature has set up, and lead to a renewal of the original mischief. A perusal of the history of the lesion cannot fail to convince the inquirer that this fatal error was committed in several instances. With the view, then, of obtaining the most perfect rest for the ruptured organ, and preserving it in a state of emptiness and contraction, a full-sized gum elastic catheter should be introduced, not further than the cervix, and securely fixed in this position.

The question may be asked—how long is it necessary to employ the catheter in the manner described ? The appearance found at one *post mortem* gives, at least, an approximative answer to this inquiry. The patient expired just eight days after the accident.—(I quote again from Dr. Harrison's memoir):—"The posterior surface of the bladder was now seen with an oblique fissure through it, about an inch and a half in length. The edges were thickened and *slightly adhering* to each other, so that I was *unable to pass any of the pelvic fluid into the bladder.*" Consequently, on the eighth day there may exist a tolerably perfect union of the lacerated surfaces. Nevertheless, I do not believe it would be prudent to dispense with the catheter at this early period. I should say, that before the expiration of a fortnight the bladder ought not to be permitted to empty itself by its own unaided efforts. Nor is the influence of position to be lost sight of. During the greater portion of this time the patient should be kept on his back with his shoulders well elevated.

With reference to general treatment, I have few observations to make. The warm hip-bath, relays of leeches for several days, opium in full doses, frequently repeated—calomel in small doses combined with it, until the mouth become affected—hot stupes, and bran poultices over the abdomen, are the means to be had recourse to, and which all practical surgeons are likely to adopt. In the case of my patient, the hip-bath afforded great relief. It was employed

immediately that the first batch of leeches dropped off; and besides causing blood to flow freely from the bites, it assuaged the oppressive burning pain in the belly. Calomel was also administered until ptyalism was fairly established; and although there is a feeling growing up at the other side of the channel that this agent does not really merit the reputation it has acquired for controlling serous inflammations, most experienced men in this country, who have observed its effects in pleuritis and pericarditis, and seen its action in iritis, will be slow to relinquish so time-honoured and trusty a remedy, in deference to mere theoretical opinions, no matter from how respectable a quarter they emanate.

In regard to counter-irritation, I may be permitted to suggest the abandonment of blisters. Several of the subjects of the injury we are considering had large blisters applied to their bellies. The absorption of cantharides from a blistered surface can scarcely be expected to relieve the patient by rendering his urine less irritating, however otherwise the vesicant may exert a beneficial influence. Sinapisms of strong mustard, if well prepared and often repeated, will separate the cuticle and do all that can be required in the way of counter-irritation, and are not open to the serious objection to ordinary blisters, just pointed out.

In conclusion, I may as well anticipate an objection which may possibly be made to the plan of injecting water into the peritoneal cavity, as practised on the patient whose case I have detailed, and which forms the text of the foregoing remarks. It may be urged that tepid water itself introduced into a serous cavity will act as an irritant, and is likely to excite inflammatory action, by reason of its low density, when compared with that of the blood contained in the capillary vessels; but we must recollect that water is less irritating than the fluid it is intended to displace or remove, that it contains no decomposing or effete principles; and, moreover, when introduced into the peritoneal cavity, it is really not water simply, but water *plus* whatever urine is present in the cavity; in short, a mixture whose density must vary according to the relative proportion of the two fluids present. In how far the practice, apart from the other measures had recourse to, contributed to my patient's recovery, must be determined by the experience of others, who hereafter may be inclined to adopt it.



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Art. XIV.—*On Whitlow.* By Edward Hamilton, F.R.C.S.I., one of the Surgeons to Dr. Steevens' Hospital.

The occurrence of an unusually severe form of paronychia during the past session has been noticed by many practitioners in this city. Having had a number of such cases simultaneously under treatment, which presented peculiar features, I have been induced to place them on record. The clinical history of inflammations about the fingers teaches us that they present modifications dependent on the anatomical structure primarily attacked, as well as on the special type of the morbid action. Having regard to the structure engaged we can recognize four forms of the disease:—*sub-cuticular*, *sub-cutaneous*, *thecal*, and *periosteal;* bearing in mind the established pathological fact that no matter in what tissue the inflammation takes its origin, it is liable to extend from one to another, so as, eventually, to implicate all the anatomical constituents of the hand. This classification was originally proposed by Garengeot, and I think each of these four varieties presents symptoms and pathological characters sufficiently marked to justify its separate consideration. The second ground of classification—the peculiarity of the inflammatory process—is generally admitted in our systems of surgery ; and although most whitlows approach closely to the *erysipelatous* type of disease, yet I think we meet with cases which may fairly be designated *phlegmonous;* while the examples which suggested this memoir were undoubtedly gangrenous, or, as that term has already been applied by Dr. Todd, in the Dublin Hospital Reports (1818, Vol. ii.) to a very peculiar and unusual form of disease affecting the hand, I would suggest the title *furuncular*, which also more clearly conveys an accurate idea of the changes which this type of the disease developes in its progress. The sub-cuticular form is truly erysipelatous in its nature, and although usually a very simple and unimportant variety, may occasion results of a most troublesome and teazing kind. When the disease commences at or spreads to the vicinity of the nail, although attended at first with the mere smarting prickling pain of superficial inflammation, the suffering becomes most acute if the matter extends under that structure. In this form of whitlow a very troublesome result of inflammation has been especially alluded to by John Hunter, and the accuracy of his delineation cannot be questioned. The small vesicle filled with sero-purulent fluid, which

is so apt to form at the side of the nail, bursts, and a granular, reddish fungus protrudes through the opening, as Hunter says, "like paint through a bladder," and being pressed by the edge of the nail, becomes most acutely sensitive, the slightest touch causing an amount of pain and suffering, almost inconceivable, as he says, "gives a greater idea of soreness, perhaps, than any other morbid part of the machine ever does." A lady who was under my care at the same time as the cases from which the drawings were taken, was unable to sleep for nights with the severity of the pain. This appearance is well depicted in Figures 1 and 2. In other examples, ulceration spreads round the edge of the nail, which becomes embedded in the sore, giving rise to the intractable disease so graphically described by Abernethy. The treatment of this sub-cuticular paronychia, when free from complication, may be conducted on the ordinary principles of surgery, as applied to a local inflammation. These are the cases in which the application of the nitrate of silver, as advocated by Higginbotham, has been attended with most success. But, to be of use, it must be resorted to on the very outset of the inflammation, as I am convinced that the indiscriminate employment of this application at a later period is not only useless but positively pernicious ; if resolution does not take place, the parts are in a worse condition from its effects, the cuticle being thereby rendered denser and more contracted, presses most injuriously on the inflamed tissues beneath. A much more useful application, in the incipient stage of the disease, is the liquor ammoniæ acetatis, used under a cover of oiled silk, as a water dressing. It softens the nail, and the fold of dense cuticle which surrounds its margin, renders the parts more pliant and yielding, and consequently less liable to irritate the tender surface around. The projecting papilla must be destroyed by the nitrate of silver applied in powder, strong solutions, or even the solid stick being ineffectual for that purpose.

It is questionable how far the cases described in the Dublin Hospital Reports, by Dr. Todd, are to be regarded as true paronychia. The symptoms were altogether peculiar, and indicated severe constitutional disturbance, which terminated in some cases fatally, while the local mischief seemed to point to some special interference with the circulation of the blood. If grouped with paronychia, they would belong to the sub-cuticular variety; but the "*paronychia cutanea gangrenosa*" is so remarkable in its history, symptoms, and prognosis, that we are fully justified in classing it as a disease *sui generis*. I





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have myself seen but a single case in which the characters attributed to it were manifested.

The second or sub-cutaneous is by far the most frequent variety; and in the majority of cases, where the disease attacks deeper structures, it extends to them from the sub-cutaneous areolar tissue; so that, in a practical view, it is the most important. A slight prick or contusion of the skin, especially with certain external conditions—probably atmospheric, for all have noticed its tendency to be epidemic—is followed by throbbing pain, heat, tenderness, and swelling. The peculiar sensation of throbbing arises from an actual increase in the calibre of the arterial tubes, effected through the vaso-motor nerves, as may be felt by the fingers placed at each side. If resolution does not quickly occur, suppuration ensues, which is usually limited, unless the constitution be unhealthy. In the early stage, no remedial measure equals the continuous hot water bath, as originally recommended by Platner ; but, to be of any use, it must be employed almost without intermission, boiling water being added to the bath until a temperature is tolerated which we could not *a priori* suppose. This treatment, combined with saline purgatives and a careful search for and removal of foreign substances, will seldom fail to effect resolution. If the disease resists this treatment, incisions must be resorted to, or it will extend to the fibrous structure beneath, and develop the third, or *thecal*, form of paronychia. In the cases which are here delineated, selected from a number under observation at the same time, the tissues were infiltrated, not with pus, but an exudation substance, having all the characters of that found in anthrax and boils, and the appearance of the surface, which is well portrayed in Figures 3 and 4, reminds us forcibly of what is seen in these furuncular forms of inflammation. The exudation substance was tough and matted into the meshes of the areolar tissue so firmly that repeated incisions were necessary to permit of its escape, small portions only appearing through the cut. The amount of constitutional disturbance was very great, indeed, and the symptoms of general irritation out of all proportion to the extent of the local mischief, patients becoming prostrated almost from the commencement. In this epidemic there was also manifested a remarkable tendency in the disease to recur after its apparent subsidence. From these repeated attacks of this peculiar inflammation, the soft structures of the finger and hand became apparently disorganized, and converted into a substance resembling adipocere, tearing across on

the least extension being made. In the treatment the state of the system from the first demanded a stimulant and nutritive regimen, with quinine and opiates at night. Incisions were made wherever the soft pulpy condition indicated the exudation deposit; and the employment of carefully adjusted pressure, applied day after day, to each finger separately, had a wonderful effect in checking the disease, and restoring the functions of the fingers, which appeared hopelessly disorganized. The great value of pressure in the treatment of anthrax and other furuncular inflammation, is now generally admitted by hospital surgeons, so that they do not hesitate to employ it in preference to every other means, even in the most unpromising cases. The resemblance, I might almost say the identity, of the pathological changes in these cases of whitlow and in anthrax, suggested to my mind the idea that a mode of treatment so eminently successful in the one would not fail in the other, and the result fulfilled my most sanguine expectations.

The *thecal* form rarely presents itself as a primary disease, but usually supervenes on inflammation attacking the soft parts, more especially of the ungual phalanx, where the various component tissues become blended, and is, generally, of traumatic origin. Here it is we meet with that characteristic deformity of the hand which is so familiar to every practical surgeon. The back of the hand swollen, red, glazed, and œdematous; its palmar aspect hard, brawny, or the cuticle soddened, the fingers semiflexed, the forearm above the annular ligament red and tense. The irritation, soon implicating the lymphatic gland, over the inner condyle, may spread even to those of the axilla. The constitution quickly sympathizes with the local mischief. The fibrous structures soon succumb to the intensity of the inflammation. The tendons slough, and the finger becomes stiff, and almost useless. Once the fibrous tissues have become fairly involved in the morbid action, I believe all treatment is utterly unavailing, save and except prompt, free, and deep incisions. Occasionally, some benefit may be derived from leeching and fomentations, with active purgatives; but the risk of losing valuable time in the trial of these means counterbalances the prospect of their success. As to the place and mode of these incisions, the directions laid down by most surgeons, and usually followed, are—to cut on the anterior aspect of the finger in its middle line, avoiding the two distal creases, which indicate the position of the phalangeal articulations. The proximal crease does not correspond to a joint, and may be divided; but it is not desirable

or generally necessary to carry the knife much above it toward the palm, as the main digital arteries divide midway between this and the palmar or metacarpo-phalangeal crease, sometimes rather nearer the web of the fingers, and are irregular as to their position on the first phalanx, and hemorrhage would be a troublesome complication to this condition of the hand. The incision having terminated at the mark, a director may be passed beneath the palmar fascia, which will permit the escape of matter. Should it be necessary to divide this structure, which is not often the case, the end of the instrument should be a little bent, so as to keep it closely inclined to the deep surface of the fascia, after it has been introduced beneath it, and thus cause it to pass superficial to the nerves and blood vessels. This division of the structures in front of the finger, down to the bone, very frequently causes destruction of the tendons, loss of their synovial investment, and, as we too often see, a stiff and almost useless finger. Hence, I have been led to adopt the lateral incision, and I think with better results. The danger of wounding the digital arteries, as they run along the sides of the finger, which has been urged as an objection against this proceeding, may easily be avoided by ordinary care, as their position can be felt most distinctly, and the operator can keep behind them. To be effectual, an incision must be made at each side of the finger, of course keeping clear of the joints. These lateral incisions are peculiarly useful, when the inflammation, as it frequently does, shows a tendency to implicate the fibrous investment on the back of the phalanges. I have never seen a case in which division of the anterior annular ligament was warranted, and I should hesitate before adopting a proceeding so fraught with danger to the integrity of the wrist. Where the matter burrows upwards under the fascia to the forearm, an incision in the middle line, above the ligament, freely dividing the fascia, will enable the surgeon to pass his director beneath the ligament into the palm, and make a track for the escape of inflammatory products.

In many instances we find the periostium participate in the morbid action, causing necrosis of the phalanx; but we meet with a sufficient number of cases in which the disease appears to have its origin in the bone or periosteum, to recognize the existence of true *periosteal paronychia.* This affection is peculiarly apt to attack the ungual phalanx of the thumb, and is invariably associated with syphilitic taint or strumous diathesis. The soft tissues retaining their health for a considerable time, frequently until the bone is completely

necrosed, and acting as a foreign body, causes an abscess, on the opening of which the bone can be felt, bare, dry, and necrosed; it can be removed without much pain or difficulty. The parts rapidly recover their health, and assume a very remarkable appearance, the nail curving forward, as exhibited in the drawing, No. 5. Constitutional treatment and perfect rest afford the only chance—and small it is—of arresting its progress. The sooner the bone is removed, the sooner will the parts recover.

ART. XV.—*Bothriocephalus Latus, or Broad Tape Worm, its Occurrence in Ireland, with Remarks on its Claim for Admission into the List of our Indigenous Fauna.*[a] By Dr. W. FRAZER, M.R.I.A., Hon. Member Montreal Medico-Chirurgical Society, &c.

TAPE worms are of rather rare occurrence in Ireland, though both Tænia solium and T. mediocanellata are met with, the latter being comparatively seldom seen, or, perhaps, it would be more correct to say, seldom recognized, for the first instance in which it was detected was recorded by myself in the *Medical Press and Circular* a few months since; I have reason to believe, however, that it has heretofore been confounded with the T. solium, and is far more common than generally supposed throughout the country. There can be no question that the broad tape worm, or bothriocephalus, is by far the rarest of this class of entozoa, for the fourth recorded case of its having been discovered in Ireland was described by me in the pages of the *Press* for April 10, 1867; the present case is, therefore, the fifth instance where it has fallen under medical observation, and it possesses peculiar interest from the fact, that whilst in almost every patient infested by this animal there are grounds for ascribing the vermination to some foreign and continental source, the patient from whom the present example was obtained had never travelled beyond the limits of Great Britain and Ireland. So far as can be ascertained, all the bothriocephali yet expelled were referable to B. latus; the species B. cordatus, common in dogs in North Greenland, and occasionally finding entrance into the bodies of their masters in that bleak territory, has not been noticed in Ireland, at least in the human being.

[a] A Paper read before the Natural History Society of Ireland.

The geographical range of distribution of B. latus is ascertained with tolerable accuracy in northern Europe; its southern limits are less thoroughly known. It prevails extensively in the departments of Switzerland, and spreads from the south of France through central Germany and Poland, at least to the eastern borders of European Russia, for a gentleman informs me he observed it at Kazan, where it is often met, though less prevalent there than the true Tænia. Northwards its habitat extends through the Baltic provinces and Holland; and Dr. Huss, of Sweden, describes it as extremely prevalent along part of the Lapland frontier, in Finland, and on the shores of the Gulf of Bothnia. In the south of Europe it has been recognized in certain of the Italian cities; and there are reasons to believe it reaches even to Northern Africa, Algeria, and Abyssinia. It is also quite possible it may yet be discovered spreading far eastwards through the regions of Central and Northern Asia, for Kuchenmeister more than suggests it was imported into Europe from those lands following the direction of Tartar and Mongol migrations from their primitive Asiatic settlements; still he admits the important qualifying fact, that in all those localities where it has become naturalized, its favourite haunts are damp and low situations, extensive marshy districts reaching along "the shores of rivers and lakes, and of the sea, and especially in parts exposed to inundations." The observations of Dr. Huss lead to similar conclusions. He says: "On the coasts there is scarcely a family altogether free from its presence, old and young, rich and poor, native and emigrants alike, suffer from the worm." In passing inland the liability to become infected decreases, and eight or ten leagues from the coast, rivers or lakes, it almost ceases to be found. Those statements regarding the favoured situations where bothriocephali flourish being marshy soil, near lakes or sheets of water, are confirmed by the history of the case I wish to record.

When collating the antecedent history of individuals from whom bothriocephali were expelled, either here or in England, it will be noticed there is one striking feature almost invariably present—namely, they have either visited or resided in some continental locality where this worm is known to abound, and the presumption almost becomes a certainty that they must have obtained their parasite during their sojourn abroad. The exceptions to this rule are of extreme rarity; thus, of the six specimens that are preserved in the museum of the London College of Surgeons, one was

got from a native of Switzerland; another from a Russian attached to the Russian Embassy in London; a third from a person who had travelled in Switzerland; the fourth came from a native of Russia, who, after long residing in England, revisited his native land, and on his return brought back with him his parasite; the fifth happened in the practice of Dr. Gull; it was expelled from a little girl, who resided at Woolwich, and is the only case of the series where the worm can be considered of indigenous origin; the history of the sixth case is unrecorded. The example which fell under my own observation in April, 1867, was obtained from a gentleman long resident in Dublin; originally a native of Russian Poland, he may have acquired his parasite when resident in the marshy districts of that land, or have become its host whilst travelling afterwards through central Germany and the Baltic provinces, previous to settling here. Strange to state, until the joints were expelled which he brought me he never entertained the slighest suspicion of harbouring worms. There is a valuable paper of Dr. Cobbold's published in the Journal of the Linnean Society for November, 1867, which treats of the entozoa that infest the dog. When describing the bothriocephali, he states the difficulty that exists in determining the exact number of species that animal may harbour; still it is admitted that B. latus does occur both in man and in the dog. As proof of this fact, "one such cestoid may be seen in the museum of the Royal Veterinary College, and no doubt can be entertained that it belongs to this species." Unfortunately there is no clue given of the previous history of the animal; probably, like most human beings, it got the worm as a result of visiting the Continent. To complete the subject of the geographical distribution of this entozoon, it should be stated that it is unknown across the Atlantic, save when imported into America from Europe. Thus Weinland, in his essay on the tape worm of man, p. 59, asserts: "We have seen two specimens of the worm in this country (America); the first was expelled from a Swiss soon after his arrival; the second was from an Englishman in Richmond (Va.), who had, perhaps, travelled in Switzerland, and, like the German anatomist and physiologist, Sœmmering, and many other travellers, brought away with him this vade mecum from the land of William Tell. We have not yet seen a specimen which came from an American, nor has Professor Leidy, of Philadelphia, as he informs us by letter."

The life history, and mode of propagation of this entozoon,

before it finds entrance into the human being, will require additional research to elucidate its mysteries; too many of the statements on the subject are repetitions of clever guess work and surmises. Dr. Knoch, of St. Petersburg, believed he had succeeded in rearing this worm in dogs by the direct experiment of feeding them with its embryos; but more careful experiments by Leuckart establish clearly the necessity of some "intermediary bearer," as is now well known to happen with our ordinary tape worm. (See Dr. Cobbold's paper in the Journal of the Linnean Society.) Carl Vogt considered it was propagated by using sewage waters that contained its ova; this is less probable than the theory widely circulated and having many corroborative facts to allege in its support—namely, that it becomes transmitted through the agency of fish used for human food. Dr. Huss, who adopts this opinion, would ascribe it to the use of salmon. So far as Ireland is concerned, either this cannot be true or else our salmon enjoy a special and enviable exception from a parasitic pest that must be very prevalent in other countries. Again, Kuchenmeister has supported the view that its scolex passes its existence in some low marshy or aquatic animal, and finds admission within our bodies suspended in the water or adhering to raw vegetables; this is far from improbable, considering the present state of our knowledge of its wide distribution over numerous countries where marshes abound.

The patient from whom the present specimen was procured resided in a healthy district in Ireland far removed from the sea shore, though close to an extensive lake in one of our northern counties. The symptoms complained of were debility and impaired digestion, and though no reason was assigned for the supposition a conviction was expressed that the deranged state of health was depending on "worms." As I thought it possible ascarides might be present, a full dose of santonine was exhibited, which produced its well-known influence on vision, imparting to surrounding objects a green or yellow tint for a few days, but it failed to expel any worm. This negative result of administering santonine shows that it exercises no power over bothriocephalus, however potent and reliable it is for destroying ascaris lumbricoides. Two or three weeks after, a few detached fragments of tape worm, consisting of adhering joints, were forwarded to me immersed in spirit; these were so shrivelled and altered in appearance that it was impossible to do more than ascertain their cestoid character, and

also that they were quite unlike our ordinary tape worm. The patient, at my request, removed to town for treatment. A brisk aperient was directed and soft diet continued for twenty-four hours, after which a full dose of oil of male fern was taken, made into emulsion with yolk of egg, and flavoured by a few drops of essence of peppermint. In the course of three hours the worm was expelled dead, and quite perfect, for I obtained the head of the animal, with fourteen feet of adhering joints. It is needless to say that the recovery was satisfactory.

The host in this case was born in Ireland, and has always resided here, with a brief interval, about four years since, while at school for six months at a small town in Lincolnshire. It was impossible to ascertain when the worm took up its residence, and the history throws no light on the origin of the parasite. Kuchenmeister's observation of its preference for lake or marshy districts is supported by the patient's home being near a large lake of fresh water, and the temporary abode in Lincolnshire was on the borders of a county notorious for its fenny districts. Whether the patient obtained the animal in Ireland, or whilst at school in England, this undoubted example of "Russian," or, as it is often termed, "Swiss," tape worm, deserves to be considered of indigenous origin, and, therefore, "British." Ireland prides itself on being free from Ophidian reptiles; there is less truth in the oft-repeated statement that we have no toads, for a flourishing colony of true Natterjacks reside in a district in Kerry. Still I had rather record their extension over half the island in moderate quantity than establish our claim to the bothriocephalus latus. It is fortunate that the patient's history admits of a degree of ambiguity; and should any zealous naturalist desire to monopolize the parentage of this entozoon for the other side of the Channel, I would offer no objection, admitting they possess at least one other example of its attacking the human being, and another less decisive of its occurring in the lower animals to support their demand. I fear, however, the evidence afforded by the present case is too conclusive to permit our refusing it admission into the lists of the British fauna, though with a strong hope that it may continue conspicuous amongst our native entozoa by its exceptional rarity.

ART. XVI.—*On Scarlatina during Pregnancy and the Puerperal State.* By S. L. HARDY, M.D., F.R.C.S.I.; President of the Dublin Obstetrical Society; Physician, Accoucheur, and Lecturer on Midwifery and Diseases of Women and Children at Doctor Steevens' Hospital.

SCARLATINA occurring during the puerperal state is so dangerous a complication that it is with justice we dread it, and take every means to guard our patients against its invasion. Not only in the puerperal condition, but during all the months of pregnancy, more particularly when approaching the full term, precautions are very desirable. How difficult it frequently is to prevent mothers running all risks during utero-gestation, when their children are the subjects of scarlatina, frequent instances are not wanting to prove. They sometimes escape under circumstances of great exposure. On other occasions, when strictly using precautions, they contract the complaint. Several instances, as examples of both those remarks, lately came under my observation during the last few months, when scarlatina prevailed in and about Dublin.

CASE I.—The mother of several children, in her eighth month of pregnancy, resided in her house (one of the worst ventilated, and not particularly clean), where her eldest daughter, aged fifteen years, had died of scarlatina, and four children besides had the complaint. I was first called to visit the eldest child when attacked, but did not again see her, as she was under the care of others. When next I was sent for I found a girl, aged eleven years, who five weeks previously had scarlatina, in violent convulsions. There was œdema of the face, slow, laboured pulse, and dark albuminous urine.

A boy, aged twelve years, was also œdematous, and his urine dark and albuminous. His pupils were largely dilated, and perfectly insensible to light. He was quite blind.

A second younger boy had an abscess in the parotid region.

Under the treatment adopted all those children perfectly recovered. The mother, as already mentioned, was in the same house with those children when I saw them. She went to another residence until they had recovered. She then returned for her confinement, which took place in about a month after, and escaped the disease.

Case II.—A female child, aged ten years, became ill. Scarlatina eruption came fully out over all the body. On being called to see her I found her mother, who was expecting her confinement, in close attendance upon her, and her sister, aged four years, playing close by her bed. The latter I had taken out of the house; but the mother remained, using, however, the precautions of seldom going into the room, and the free use of disinfectants. Within a month after, this lady was confined, and had no untoward symptom. The child, who had been sent out of the house, also escaped the disease.

It was doubtful whether in this instance the mother had scarlatina formerly, but the young child never had.

Case III.—A lady, in her second month of pregnancy, was in close attendance upon her child in severe scarlatina. She felt very ill, and contracted the disease herself. She passed favourably through its stages, but was very long in regaining her strength. The symptom upon which she depended as enabling her to consider herself pregnant was a bitter taste in the mouth. It continued during her attack of scarlatina. Pregnancy progressed steadily, and at the full term delivery was safely completed.

The next two cases are instances in which the patients were attacked with scarlatina at some short time after parturition.

Case IV.—In the month of February last a lady, who was expecting to be confined of her ninth child, had a very severe attack of influenza, which confined her altogether to her bed. It was necessary to support her strength in every manner by the liberal use of wine, beef tea, &c.

She had made considerable amendment when her confinement came on. Delivery was got over without any untoward symptom to mother or child. A wet nurse was in readiness for the infant, so that the mother's strength was not taxed in the respect of nursing, a task for which she was quite unequal.

The recovery for the first fortnight progressed slowly but steadily, the nourishing treatment being all along carefully continued. At the end of this time pain of a neuralgic character was complained of in the right leg below the knee. There was no swelling, nor blush of the limb, and in the course of a few days it got well. She was soon able to walk about her drawing-room, but did not leave the house.

When just two months confined she had an attack of fever, which developed a very copious eruption of scarlatina. Sore throat was complained of, and the tonsils and fauces appeared swollen and inflamed.

Although up to this she had been progressing favourably, yet the strength was by no means restored to its usual state. It was necessary to give wine and nourishment very freely.

The disease passed through its stages, and desquamation followed without interruption, and before the end of a month the skin was looking clear and healthy. Exercise was taken by walking through the drawing-room.

She now went, for change of air, to reside several miles in the country. On the second day she drove out in an open carriage. She felt cold, became very feverish, got sore throat, and was covered all over with a scarlet eruption. I was called to see her. She had a decided scarlatina eruption. This attack passed through the stages, as the former one, but more mildly, and distinct desquamation followed.

I have met with scarlatina recurring the second time in the same individual on several occasions, but never within so short a period from the first invasion, as in this case; exactly one month had expired from the first to the second seizure. Some years ago, when attending a female child of five years old in scarlatina, her brother, who had it one year previously, came into the room. He had scarlatina a year before. He had it again on this occasion with his sister.

The last case I shall mention is one in which scarlatina came on very soon after delivery.

Case V.—Mrs. B. came to Dublin for her second confinement, which took place the 19th of October last (1867). She was at all times delicate, but the very little strength she had was sadly taxed by close attendance upon her mother, who had paralysis, and required constant attention. A few days before her confinement she was attacked with influenza, and was so reduced by it that I had great fears for her delivery. This, however, was got over, and she went on favourably until the fourth day, when the pulse became extremely rapid (140), with high fever. As the breasts had become very hard, I hoped the fever was caused by the coming of milk, but shortly after scarlatina eruption appeared all over the body and extremities.

During the first few days there was very great distress, with delirium. The fever then gradually subsided, and recovery progressed most favourably. Throughout the attack the lochial discharge continued of a florid colour, but was of most offensive odour, requiring great attention from the nurse. Extreme debility was so prominent from the time of this patient having influenza that wine and nourishment had to be freely and regularly administered. There was some disposition to diarrhea, which was easily restrained by chalk mixture.

It is satisfactory to be able to state that the children, who were sent to the country, escaped the disease.

Soon after her return to the country this lady wrote to me, saying she felt so remarkably well she could scarcely believe she had been so very ill when in Dublin. I have since had a letter from her reporting a miscarriage in the second month.

This case bears out what has been remarked by Dr. M'Clintock in his paper on "Scarlatina Complicating Childbed"—the secretion of milk and the lochial discharges, with the involution of the uterus and vaginal contraction, all went on without interference. The fetor of the lochia was the only thing which required particular attention, as already mentioned.

It was a fortunate circumstance that even so many as three days had elapsed after delivery before scarlatina manifested itself, thus giving the patient a better chance of recovery, as is well exemplified in Dr. Halahan's report, read before the Dublin Obstetrical Society, and published in this Journal, No. 71. By referring to this report it will be seen that recoveries from the disease diminish the nearer the date of attack to that of parturition. The same was observed in the Vienna Lying-in Hospital in an epidemic of scarlatina in 1799. It was owing to this circumstance that recovery in the present case may very much be attributed, together with the large amount of wine and nourishment. Coming on after the depression of influenza, and the shock of delivery in a constitution naturally weak, as the patient's was, but for the very free use of stimulants the result, I greatly fear, must have been unfavourable.

It is worthy of remark that in the Cases IV. and V., where scarlatina attacked the patients after delivery, neither of them had in any way, which could be known, been exposed to contagion. They were confined to the house for a considerable time, owing to their having influenza previous to their confinement. They were

extremely debilitated, and required the same liberal supply of stimulating treatment. Case IV. is particularly interesting as affording a well-marked instance of the recurrence of scarlatina in the short space of one month from the first seizure of the disease, being in both attacks distinctly marked with all its characteristic features.

ART. XVII.—*The Epidemic of Cholera at Malta in* 1865. By ED. J. BUTLER, L.R.C.S.I., Assistant-Surgeon R.N.

IN giving an account of the epidemic of cholera which visited the island of Malta in the year 1865, the points necessary to be noticed, in the first instance, are, the origin of the disease, and the circumstances connected with its conveyance to Malta.

From the report of Dr. Aubert Roche on the cholera of the Isthmus of Suez, it appears that the disease was rife at Djedda and Mecca in May, '65. Many thousands of pilgrims were collected there, and the dead lay unburied in the streets.

On the 19th of the same month an English steamer, from Djedda, arrived at Suez with 1,500 Hadjis or pilgrims, a number of dead having been thrown overboard on the passage.

At Suez the first cases occurred on the 21st May. Between that date and the 1st June several thousands of pilgrims passed from Suez to Alexandria, cholera being amongst them on their route. The first case among the inhabitants of Alexandria occurred on the 2nd June. From this time the number of cases increased till the invasion was complete at that place.

On the 31st May a steamer arrived at Malta after five days' passage from Alexandria, with 235 pilgrims; 61 of these were landed, and the rest went on to Tunis. Three Hadjis had died on the passage from Alexandria, but there being no medical officer on board, the causes of death were uncertain. From the 1st to the 9th June seven steamers arrived, with 237 pilgrims, and several other vessels brought passengers from Alexandria, all of which had *pratique*. On the 14th June the Government issued an order that all vessels coming from Alexandria after that date should undergo seven days' quarantine.

On the evening of the 14th three vessels arrived from Alexandria, and were, of course, subjected to the established quarantine. These vessels conveyed 176 passengers to Malta, who were landed at the

Lazaretto to serve their period of quarantine. Forty-eight of these passengers were Hadjis. One was reported to have died on the voyage of "bowel complaint."

Between the 14th and 20th June, 178 persons, chiefly Maltese labourers, who had been employed at Alexandria, and had left it on account of the pestilence, arrived from the latter place and were quartered in the quarantine establishment. Thus, on the 20th June 254 persons were in quarantine at the Lazaretto.

The first case among the inhabitants of Malta occurred on the evening of the 20th in a building distant about 200 yards from the Lazaretto, where a detachment of the Royal Artillery and another of the 4th Regiment were quartered. A daughter of one of the gunners, aged nine and a-half years, was attacked on that evening and died at noon on the following day. Up to the 29th three more cases occurred in the same quarters, two of which proved fatal.

On the night of the 27th a man who had been employed that day whitewashing some rooms in the building where the cases broke out among the Royal Artillery, was attacked at his home in Casal Attard, and died on the 29th.

The detachments of artillery and 4th Regiment, which had suffered, were removed on the 30th June to Floriana, a district on the opposite side of Quarantine Harbour, close to the town of Valetta.

On the 1st July five cases occurred among the women of these detachments at their quarters in Floriana. By the 10th July the disease had spread to all the districts adjoining the harbours, and in a few weeks there was cholera in every village of the island.

The above-mentioned facts concerning the origin and progress of the disease are taken, in the main, from a pamphlet published by the Superintendent of Police at Malta.

These facts show clearly that the disease originated at Mecca, and was conveyed thence directly to the island. Breaking out among the thousands of pilgrims collected at Mecca for devotion, it committed ravages amongst them to an extent easily understood when the habits, &c., of that class of people are considered.

These pilgrims, making their way homeward to the northern parts of Africa, brought with them, as shown above, the cholera poison, diffusing it on their route in places and among people eminently suited for its reception. We then have these Hadjis and other persons taking passage by sea, calling at Malta, and many of them remaining there. There is evidence that some of them died on the

sea voyage; and, subsequent to the arrival of the rest, the first cases among the dwellers at Malta occur in persons living close to the place where these carriers of disease were housed. The instances of the detachment of troops stationed near the Lazaretto being attacked with cholera, and conveying it with them to their new quarters at Floriana, and of the man who, after working all day at the same place, died of the disease at his home some miles distant, seem to point clearly to the quarantine establishment as the centre of diffusion of the imported pestilence.

During the period of the epidemic I was serving in H.M.S Hibernia, the guardship at Malta; and though no case of cholera occurred on board, I had ample opportunity of witnessing its ravages on shore. The ship was moored in Dockyard Creek, between the crowded, populous towns of Isola and Vittoriosa. In these towns the dockyard workmen and their families lived, and also the families of men belonging to the fleet. The latter, when attacked, applied to the ship for assistance. I also attended the cases that occurred among the dockyard people and the poor Maltese in the neighbourhood, with the staff surgeon of the yard in whose charge they were.

The features of the disease, as I saw them, presented nothing peculiar for remark. All the symptoms ascribed to Asiatic cholera were well marked, though they were not combined in every case. In some there was very little vomiting and purging; in others these symptoms were excessive, and most distressing, and accompanied by great thirst, but the extent of these bore no ratio to the fatality of an attack. Cramps were not severe, but in every case restless tossing about was most marked, rendering the application of local remedies almost useless.

The choleraic face and skin were always observed, and there was total suppression of urine in every case. As a rule premonitory diarrhea ushered in an attack, but in most cases it was so slight, and of such short duration, as to be overlooked by the patient and neglected, and in the majority of cases the stage of collapse had come on when advice was sought. The latter stage generally lasted from eight to eighteen hours. During the whole period of the epidemic, diarrhea was very prevalent, few persons having escaped an attack, more or less severe; and to such an extent was this the case, that I am strongly of opinion that the choleraic poison influenced every one, but worked its fatal effects only in those in some way predisposed to it, bringing on collapse in persons of low vital

powers. With few exceptions the mortality was confined to the badly fed, badly housed population, and in the cases which occurred in persons of a better class, there may have been a predisposition to the disease arising from constitutional causes, or such predisposition may have been induced by a system of abstinence, or otherwise adopted through fear.

While the essential nature of the cholera poison is a mystery, I don't think it is too much to say that it is capable of producing diarrhea, with or without cramps, in one individual, and fatal collapse in another, varying in its effects according to the constitution of the person exposed to it.

Although the disease prevailed in particular localities, where it was multiplied by discharges, &c., which were not or could not be effectually removed; yet isolated cases occurred which could hardly be attributed to immediate infection, but seemed to be the result of the diffusion of the poison through the atmosphere. In the naval hospital, a man who had been a patient there for some time, and was in an advanced stage of phthisis, died of cholera. This hospital, which is a model establishment as regards good hygienic conditions, stands isolated and on high ground, and communication from without is limited. In this case no such cause for attack could be assigned as exposure to emanations from infected persons, or drinking water contaminated by cholera discharges.

Judging from this and similar cases, it may be inferred that the choleraic poison once imported by men and ships, besides being infectious through discharges and emanations from the sick, is capable of being transmitted by the atmosphere, and producing fatal effects at considerable distances, independent of any other means of communication. This fact, of course, is not a new one, but I mention it as it bears on the subject of quarantine, and especially on quarantine as carried out at Malta.

The Lazaretto, or quarantine establishment, is situated on an island in a most central place, having the populous towns of Valetta, Floriana, and Pietro, on one side, with a strip of harbour intervening, and on the other side Sliema, with large barracks close by. In this place were crowded all the people who came from Alexandria after the middle of June; and it would be strange, indeed, if the disease, with its well-known infectious and diffusive properties, thus introduced into the midst of a thickly-populated district, should not spread. As a matter of course it did so, and, under the circumstances, the details observed by the

authorities in enforcing a strict quarantine were superfluous and almost ridiculous. All the minor rules of quarantine were rigidly carried out by the police after the disease was well settled in the island.

I do not for a moment attempt to depreciate the utmost strictness in enforcing the rules of quarantine; however, when all the important conditions of quarantine are neglected, I cannot look on such strictness in details as otherwise than absurd. Surely it is an outrage on common sense, as applied to sanitary matters, to subject to quarantine a boatman who picks up a bottle thrown from a ship undergoing quarantine with no sickness on board, because that bottle has a paper label, and yet permit hundreds of Hadjis from the seat of pestilence, in all their native filth—most excellent vehicles of infection—to be huddled like sheep in a building occupying a central position in a healthy community.

In fact, the Lazaretto can hardly be considered a quarantine establishment at all, but rather as a favourable place for collecting persons from infected quarters for the purpose of spreading disease among the people. There are places in the island some miles distant from the chief towns, with good anchorage for ships, and there are islands adjoining with similar advantages. If at any of these there were establishments for the separation of passengers arriving from infected places, a rigid system of quarantine might be effectual, and the inhabitants would have the advantage of distance in resisting the invasion of a pestilence.

The intentions of the police authorities in endeavouring to check the spread of the disease from house to house were praiseworthy; but they were of little use, and naturally so.

The crowded state of the houses, the narrowness of the streets, and bad drainage contributed to render their efforts of no avail. In many houses in the old parts of the town there are communications with the sewers in the entrance hall, covered only by a grating, and in such houses there is little use in fumigating a room where a person died of cholera. Of late years the sewerage of Malta has been improved, but it is still defective.

Taking into consideration all the circumstances connected with the origin and spread of the cholera epidemic in question, we may dismiss the case of the disease spreading by water contamination or other means.

The period of the invasion was the natural period of drought in

Malta. The temperature was very high. Many of the poor were thrown out of employment, and therefore lost the means of subsistence; and the natives were decidedly panic-stricken. Coupling these influences with the effects of overcrowded dwellings in narrow, filthy streets, it is no wonder that the disease had many victims. In fact, putting together all the conditions—moral, social, and hygienic—of a people like the Maltese, when visited by an epidemic, it is only a matter of surprise that the population under such circumstances is not decimated.

Laudable efforts were made by the Governor and private individuals to assist the poor and those who were out of employment. Soup of very good quality was served out to those who had no means of subsistence, and dispensaries were established where medicines could be obtained gratis.

Not a single case occurred on board the "Hibernia," with her compliment of fifty marines, and the same number of Maltese sailors, besides supernumeraries, although the ship was moored close to infected places. Our immunity from sickness may, I think, be attributed partly to the excellent hygienic conditions in which the men were placed, and partly to general precautions. The ventilation in a large three-decker for so small a number of men was of course good. The men's diet was ample and wholesome, as is always the case in men-of-war when in harbour; and there was no panic. Leave was granted as usual, and no restriction was placed on the Maltese portion of the crew, as regards visiting their families. But a man who had gone on shore was not allowed to return to the ship for a considerable time, if it was known that a case of cholera occurred in his family. The men were not allowed to buy fruit in the usual way from the boatmen attending the ship; not that fruit was considered injurious, but because the men usually observed no moderation in eating fruit, and no discrimination as to its ripeness or otherwise. They were particularly enjoined to report themselves on feeling the slightest indisposition, and this order they strictly observed.

Many cases of bowel affection were treated during the epidemic, most of them not sufficiently severe to incapacitate a man for duty, but all were treated promptly.

As regards the treatment of cholera when it assumes its worst form I can say very little. Of the cases I saw a few only recovered when the stools became rice-watery, and one only where the symptoms of collapse were well marked. All the means advocated were

used to support the sinking powers. Brandy and most of the stimulants in the Pharmacopœia were given, and their effects watched, and external applications of the same nature were always assiduously adopted, but with no good result. This treatment seemed to check the vomiting and purging and to relieve cramps, but did not affect the nervous system sufficiently to bring about restoration of the suspended functions. However the poison may be introduced into the system, whether it primarily enters the blood and subsequently, more or less quickly, influences the nervous system, or whether it first directly affects the nerves of organic life, I look on the symptoms in the stage of collapse, when most cases are seen, as entirely those of nervous prostration and poisoning, indicating a line of treatment directed to that state.

Giving physic, therefore, with a view of restoring suspended secretions in organs whose functions are arrested in consequence of suspended innervation, is, I fancy, useless, especially when the most powerful medicines seem to have none of their usual therapeutic effects in these cases. I have no doubt of the efficiency of medicine and remedial agents in the first stage of the disease, in the stage of choleraic diarrhea; but in the epidemic in question this stage was so mild, and of such short duration, as not to attract much notice till collapse came on, when remedies were of very little use. Although some think that choleraic diarrhea is not a stage of cholera at all, yet an attack of diarrhea during an epidemic of cholera is a suspicious circumstance, and should not be neglected; and though I think the poison is capable of producing milder effects in some than in others, according to their constitutional powers of resistance, still I should be sorry to neglect these milder effects, lest their continuance should so far debilitate as to predispose to a more severe attack. In fact every indisposition during an epidemic of cholera should be treated promptly. Treatment during the stage of collapse can only, I think, be successful when directed to the support of the sinking powers, thereby sustaining nature, while an effort is made to eliminate the poison.

My experience of the disease is not sufficiently large to enable me to enter more fully into the subject, but I have seen enough of it to be convinced that much may be done by precautionary measures, and very little by treatment.

ART. XVIII.—*The Oxide of Nitrogen as an Anesthetic Agent.* By CHARLES KIDD, Sackville-street, London, M.D., M.R.C.S., London; Associate Member Surgical Society, Ireland; Physician Royal Westminster Dispensary, &c.

IN continuing the study of anesthetics, their special mode of action, the nature of fatal accidents from chloroform, ether, and such like agents of that class (on all which various papers by the author appear in this Journal) attention has been particularly drawn in the present year to the administration of a comparatively new anesthetic or partially asphyxiating remedy now much used in London—the nitrogen protoxide, or so-called "laughing gas," which still continues to be exhibited very extensively as a substitute for chloroform.

The very great alleged advantages of this "gas" as an anesthetic have been agitating the profession of late, and very extensive experiments on the lower animals have been instituted to test it.

The author, with a wide experience of chloroform administration, has thought it well to explain, in a few brief observations, how these two agents appear to him to differ; and in this differentiation, what are the physiological advantages, what the good qualities of this "gas," how it affects the blood, and so on. These remarks profess to be purely clinical rather than speculative or chemical. Added to these purely physiological or clinical suggestions he offers a new theory of the *modus operandi* of the gas as well as some practical remarks on vomiting, so common under chloroform, but absent under this anesthetic.

Having noted with much care, and studied with attention the physiological and one or two commonplace practical results of the nitrogen protoxide administration, these remarks are offered as a sequel to his other papers on anesthetics, as well as to elicit discussion on the general theory of anesthesia so induced.

One of the more obvious phenomena or differences between this gas and chloroform is its influence on the muscles of the entire body, which are not relaxed, but stimulated by the protoxide. Else in many of the more violent surgical operations with this gas on the jaw, where a powerful wedge is placed to keep the jaws asunder, one could not have failed before now to find dislocation of the jaw, if the masseters and other muscles or tissues were relaxed, as they are under ether or chloroform.

A very remarkable "twitching" of the muscles is one of the early diagnostic marks of the patient or subject for surgical operation, being fully under the anesthetic influence of the protoxide It is entirely different from the struggle under chloroform.

This twitching, according to the views of the author, is caused by dark venous blood irritating the source of muscular power, for all the muscles at one side of the body, in some cases, will be irritated all and severally, and not on the opposite side.

It is not necessary, perhaps, to give any general description of the usual mode of administration of this nitrous oxide gas; suffice it to say, that the procedure is almost identical with the administration of chloroform in hospitals, as familiar to all surgeons. The gas must be pure, and unmixed with air. The patient is found to inhale it quite as readily as chloroform; but the effect to the bystanders is curiously different, nay alarming, when this gas is inhaled. The anesthesia is complete in about sixty seconds.

In place of the calm, gradual sleep under chloroform, the face unaltered, especially in children and women, the same patients, under this gas, are violently agitated, as if in a state of suffocation; the expression of the face is suddenly and entirely altered.

The patients, as a rule, though it is styled "laughing gas," do not laugh, but rather go off into a curiously half epileptic condition, with the invariable twitching or spasm of the muscles, and then total insensibility.

One sees, now and again, very violent apparent distress in some one or two of ten cases under laughing gas, the face of the patient assuming a purple, ghastly, and frightfully death-like aspect; the eyeballs bulging forward from muscular contraction; the expression of the face is like that of a person suffocated. All this is attended with what appears dangerous epileptic, or epileptoid, convulsions, or, possibly, well-marked tetanic spasm or tension. The patient, while under the "gas," to the relatives or friends, and those about him, wears, it must be confessed, an appearance repulsive in the extreme, as if in the fell grasp of some ghoul, or overwhelming death-struggle! Yet struggle and convulsion will all cease in a moment just as suddenly on admission of atmospheric air. The grasp, as of some monster, on the muscles relaxes; the repulsive appearance of the face, the spasm and tension, the tetanic bending of the body, the convulsions epileptoid or epileptic, the suffocation, the eyes "without speculation," the bulging eyeballs, the ghastly,

purple, livid aspect of face, with the other symptoms, all suddenly vanish. The patient, perhaps, smiles, and assures you he has felt nothing at all either of the surgical operation or the struggle. No doubt much of this struggle has been automatic or reflex, but to the friends of the patient it is very horrifying.

In a few instances the violence of the struggle has been so prolonged or great, attended with such marked or startling signs of deadly suffocation, that it was feared at the moment the blood vessels of the brain might give way, especially the arteries, and precaution was taken accordingly.

Yet, still, from the depression of the pulse, so observable under this struggle or full action of the gas, one is inclined to think that there is stagnation in the pulmonary capillaries, and more pressure on the venous system than the arterial. The pulse, as a rule, is suddenly depressed under full action of this gas.

The nitrogen protoxide, when inhaled, as a general rule, is very uniform, and, perhaps, safe in its results; though, by an extended experience, the author has seen exceptions to the general rule of its entire or uniform harmlessness. In one case of a female patient at the Dental Hospital very great alarm was felt by the surgeon for a short time, as, in addition to these signs of struggle, or the asphyxiant stage, the breathing almost at once suddenly stopped, the whole expression of the face became death-like, or fixed as if in marble. Three teeth were extracted passively, or without sign of suffering; the usual bleeding from the gums had stopped. A state like catalepsy came on, but the pulse, which the author carefully marked, continued good all through the period. Vigorous measures to restore breathing were had recourse to, else this patient would probably have died. In a similar case in America the patient never recovered; the cork wedge had got into the pharynx in the struggle!

In another female patient, on the contrary, where, without any anesthetic or gas, a curious syncope or fainting fit was induced by fear of the pain of tooth extraction, attended, with utmost exhaustion, at one part of the hospital; the woman was brought, pale and faint, to the operating theatre, where the gas is administered, from another part of the hospital. Few persons would have given such a patient chloroform, if fatal accidents under that agent be due to cardiac syncope. The author watched this patient with painful attention. There was unmistakable syncope present, but the gas, at the first inspiration, restored her to life and spirits.

What, then, is the nature of this physiological state, these fears and idiosyncrasy?

It has not yet been proved with sufficient precision what exact amount of carbonic gas is given off from the lungs during the four or five minutes such a patient is inhaling the nitrogen protoxide for a surgical operation; or, in other words, how much carbonic acid gas is retained in the blood.

If ordinary asphyxia, with absence of oxygen and accumulation of carbonic acid, be marked, as it is, by stagnation of blood in the pulmonary capillaries, the quantity of blood oxygenized returns to the heart gradually diminishing, its condition becoming more and more venous, till at last the pulmonary circulation ceases or stops—if a warm-blooded mammal can be reduced to a state of hybernation, when the waste of its tissues diminishes so as to require very little carbonic acid gas to be given off—if living animals have been frozen till apparently dead, and brought to life again, this waste of tissues partially suspended, and oxygenation in abeyance, we have in all such cases an analogous state. We know that frogs, caterpillars, snakes, fishes, &c., have been thus frozen till they chinked on glass like bits of ice, and yet were restored to life, so to speak, several days after, on being thawed. This shows, also, that the ordinary process of oxygenation of the blood may be stopped, and yet a low form of life like that under the asphyxia of this "gas" be carried on.

If we now ask what are the advantages of this deadly agent in surgery or medicine, the answer will be in some form as this. The chief advantages of the nitrogen protoxide over chloroform or ether, as far as they have yet appeared, are—(1st), the quickness of action of the gas; (2nd), the slight after effects; but specially, and above all (3rd), the absence of vomiting, which latter, under chloroform (especially when carelessly administered), is sometimes—for instance in ovariotomy or hernia, or eye operations—most troublesome, if not the immediate cause of death!

The author has observed one case, however, out of half a dozen already reported, where vomiting or violent retching occurred under the "gas"—that of a delicate female for a tooth extraction; but, as a general or practical rule now observed in some 800 cases, vomiting is absent. This arises from the gas not irritating the pharynx, œsophagus, and laryngeal nerves.

Then as to the quickness of action of the protoxide. It must in contrast be said the balloons—so useless: *omne ignotum pro magni-*

fico, as Mr. Simon says of cholera theories: the complex valves, &c., give a glamour of fear and terror to chloroform that it does not deserve, all which prevents country surgeons from giving it a fair trial. Fear invites all evils. "Quæ metuant lingunt," says Lavater. It is only wise or fair to place in contrast with this the alarming appearance of the patient, and the excessively cumbrous gasometers, tubes, valves, &c., which it is necessary, especially in private practice, to carry about with the surgeon in cases where a few drops of plain chloroform would, in all probability, if skilfully administered, act quite as well.

A very large fixed gasometer, capable of containing 106 gallons of the nitrogen-protoxide, has been recently, however, placed in the operating theatre of the London Dental Hospital; and even portable small gasometers for single cases, not unlike the ordinary "Hutchinson's Spirometer," have been manufactured for private practice!

How does this gas differ from chloroform?

The appearance of the patient under chloroform narcosis; the healthy appearance of the scarlet blood of such chloroform patient in the arterial jet at surgical operations, and such like phenomena in experiments with chloroform on the lower animals; the comparative manageableness or slowness of the operation of chloroform contrasted with the general effect so rapid and alarming of the protoxide; the quickness of action, the dark venous character of the arterial blood, the livid, cold, death-like appearance of the surface of the skin under this gas, &c., all tend to show how differently these two agents influence the system.

We have here under this gas rather a modified form of asphyxia, with its insensibility to pain, yet freedom from danger! Probably because the process of asphyxia or hybernation, so to term it, may be stopped at once by permitting air into the lungs in case of danger, and then all anxiety ceases.

Bichât demonstrated, even in his day, that such a form of hybernation or sleep, with insensibility or modified asphyxia, could be imitated in animals, and was tolerated in cold-blooded animals, especially with cold surface, by passing, as an experiment, the venous blood of such animals into its adjacent artery, or by freezing animals, so common in Spallanzani's experiments.

The nitrous or protoxide "gas" has been administered for a few small surgical cases, such as excision of condylomata, opening of abscesses, amputation of toes, where it is now beginning to be

admitted that chloroform has proved more dangerous than in large capital operations. In these special surgical instances one would say—the gas has at once alarmed but satisfied the operating surgeon.

It has helped to magnify the evils of chloroform—rather chloroform in inexperienced hands. The advantages and disadvantages are about equally balanced; but as a physiological study, the gas is very full of interest.

The essential *modus operandi* or action, according to the author, is to afford a passive stimulus to the larger bronchial tubes, while the lower hybernating process of respiration goes on in the pulmonary capillaries. This dark blood, circulating in the systemic arteries, producing this curiously leaden death-like appearance of the patient, and anesthesia.

It is possible the venous condition produced by the gas might hereafter be available in blood-poison cases, snake bites, and such like, where it is advisable to alter the crasis of the blood suddenly; or, in the treatment of aneurism, to favour coagulation in the sac. It might help the degeneration of some malignant tumours into fat; but its use in general surgery must be very limited, on account of its cumbrousness.

Facts such as the following show further the *modus operandi* of the gas:—Several patients have had administered to them the same eight gallons of the protoxide repeated over and over again, three, four, or more times, the same gas inhaled, exhaled, and then inhaled again. Still the gas has not lost any of its sensible properties of rendering the patient insensible. This tends to indicate that this gas is not absorbed or decomposed by the blood in the lung or pulmonary capillaries, but affords a kind of artificial stimulus to the organs of respiration, while a low form of life, as in hybernating animals, is carried on in the capillaries, or air cells.

The author is inclined to believe that this is rather the *modus operandi* than that usually believed—viz., that the gas saturates the blood, and is given again off unchanged; and for this reason, that any given quantity of seven or eight gallons of the gas has not had time enough thus to mix with the blood, nor are there any traces of the effect of the gas on the blood. As in similar administration of chloroform, vapour or ether, and notably of carbonic oxide, all which act on the blood corpuscles, carbonic oxide breaking up the corpuscles entirely, and ether or chloroform, though not acting so powerfully, being still perceptible in the blood, and easily

re-distilled from the blood where thus administered—phenomena all absent as regards this nitrous oxide gas.

The quickness of recovery from the state of asphyxia under the gas, the rapidity with which arterial blood again diffuses itself over the face and neck of the patient, is very wonderful. The arterialization of the blood, on admission of air, is instantaneous. The mode of life of hybernating animals, or of the *fœtus in utero*, or in cyanosis, where the two sides of the heart communicate, will afford at least some loose analogous instances of this condition of life carried on with dark blood in the arteries. In the asphyxia under this gas, when air is permitted to the patient, the recovery is as if a spring were relaxed, the red blood rushing at once through the vessels.

Respiration, it need hardly be said, is a function, in a physiological point of view, of a double nature, related on one side to the brain and spinal chord, to which it owes the mechanical action of the lungs, intercostal muscles, diaphragm, &c.; and on the other side to the heart, which is the medium of transit of the blood to be arterialized or oxygenized; and so we have two forms of death in accidents from anesthetics.

In fact, the relation existing between brain and lungs in birds, mammiferous reptiles, fishes, &c., is reciprocal, showing, too, how little we can judge of such accidents in them and the human subject.

Finally, as to the practical value of the protoxide!

As to the absence of vomiting, so desirable, as once believed in eye operations, especially in cataract cases, it is now found in practice that a slight amount of vomiting does not do as much harm, as theoretically supposed, in eye cases. Nor is vomiting very frequent under chloroform, where the surgeon or administrator is familiar with certain methods of preventing vomiting, which arises from irritation of the pharynx, and is probably not "cerebral." In eye operations under the protoxide there is rather dangerous bulging forward of the eye, caused by the twitching of the muscles of the eyeball. This alone may always render the protoxide of questionable desirableness or superiority as an anesthetic in eye operations. The eye is also found to roll and bulge in a curiously unsteady manner under operation, so that although there be no vomiting there is reason to fear there would be much risk to the vitreous humour or iris in cataract cases, from the protoxide and from this irregular action of the muscles.

Nor is the ether spray at all advisable as a local anesthetic in freezing the fluids of the eye. The ether spray, in fact, is entirely without value in tooth-drawing, or eye operations, or large amputations; so that the practical surgeon in all the London hospitals at present is driven back to the adoption of plain chloroform, as at once the simplest anesthetic, and the one best understood by students, nurses, and patients. The ether spray congelation, in fact, is generally discarded in dentistry and eye operations.

The nitrogen protoxide has already been used in London this year in nearly a thousand tooth-drawing operations, where it has given much satisfaction by this quickness of its action, and this entire relief from pain and safety, though condemned at first, in favour of the "spray."

The author of the present communication has no doubt whatever that the relief from pain and general satisfaction would be quite as great if chloroform had taken the place of the nitrogen protoxide in these cases, and if in place of many and abounding popular prejudices against chloroform, which are encouraged too much in our popular literature to favour voltaic narcotism, or methylene or patent "mixtures," the same study and interest could be secured in dental hospitals for chloroform or ether as for this "gas," we should have less reason to be dissatisfied with the older anesthetics, and have less fatal accidents from anesthetics in general.

These chloroform accidents, the author still believes, as first stated *in extenso*, in the "Transactions of the British Association," are due in a large measure to idiosyncrasy or sudden fear on the part of the patient, rather than prolonged exhaustion or narcosis under the chloroform.

These chloroform accidents are sudden, as if from spasm of the glottis and pulmonary apparatus, rather than deep coma or cardiac syncope.

Nearly all the death accidents (now numbering about 300) from chloroform have been in strong, sensitive individuals, during or before very trivial operations, from fear of coming pain, showing how unwise it is to exaggerate this fear of chloroform in favour of a gas with so few advantages.

The practical medical man, in a word, may have, in tedious long operations like ovariotomy, or in tediously long midwifery cases, when patients struggle almost as if under this "gas," being often livid, comatose, or stertorous (very probably from absence of air), he may have a condition of asphyxia running parallel with the

condition of anesthesia, but not identical, but still no danger so long as the respiratory muscles are acting with vigour under the chloroform.

The more immediate cause of danger, as supposed by Dr. Brown-Séquard, being a spasm or reflex irritation sent suddenly in some patients with such idiosyncrasy from the lung to the heart, or, possibly, from the glottis and laryngeal nerves. Perhaps old Melancthon was not so wrong after all: "*Mœstitia cor quasi percussum tremit et languescitre*, fear strikes the heart, makes it tremble, and the black blood under the ribs on the left side makes these convulsions so fatal."

The inhalation of the nitrous gas is not attended with any appreciable change of pulse at the wrist till the patient shall have been fully under it; then it becomes suddenly weak, as the dark blood pervades, probably, the heart tissues; whilst, on the contrary, under chloroform, the pulse rises and becomes larger as the anesthesia progresses. This large pulse, as Dr. Brown-Séquard suggested to the author, is not a stimulant, but rather a paralytic action of the coats of the artery. Nor does the pulse sink in ovariotomy, as theoretically supposed, by a synthesis of disease from experiments on animals with voltaic narcotism, or chloromethyl in laboratories; the pulse rises in ovariotomy under chloroform.

The advocates of the coagulation of the blood from escape of ammonia or voltaic narcotism profess themselves no experience of chloroform or nitrous oxide in actual practice; hence many errors.

The author, in conclusion, is of opinion, that it is indeed rather as a physiological study as to experience of such agents in the human subject that the adoption of this anesthetic at present is so worthy of the attention of the profession.

The surgical experiments have been witnessed in London with great and increasing interest; and if we could but ascertain with exactitude, independently of the chemical theory of the synthesis of disease or diffusion of gases, what exact amount of carbonic acid gas is given off during the period of the asphyxia stage under the protoxide, or what precise quantity of carbonic acid, in other words, is retained in the blood, we might then be in a position to explain the *modus operandi* of the new gas in a more satisfactory manner.

As a physiological study, these experiments in London lend no little corroborative proof to the views already published by the

author—namely, that in surgical practice, whatever *a priori* reasoning may say to the contrary, the surgeon, in the use of chloroform or such anesthetics, may have aggravated stertor, and a condition almost like coma, in the patient on the operating table; but it is not so dangerous as sudden spasm!

If the cardiac syncope theory, in fine, were true, no one would be justified in administering chloroform at all.

The nitrogen protoxide too, though condemned hastily, has now been given in America, France, and England, in some thirty thousand cases. It indicates that experiments in animals with the "gas" are only "part of the truth," when brought to bear on the idiosyncrasies or fears of hospital patients. In a word, the condition of the system under this "gas" explains much that was wanting as to whether asphyxia is so dangerous as the advocates of complex inhalers, to prevent cardiac exhaustion from more than three per cent. of vapour, had imagined. Chloroform, as once said of antimony by the good old fathers of the profession, "is like Scanderberg's sword, strong or weak—a poison or a great benefit, as it is used"—a worthy medicine, if applied simply. While this "gas," from which already two deaths come to us from America, with its alleged advantages, does not seem entirely as great as other revolutions, political or journalistic, of the present Autumn, and only an indifferent substitute for the old fashioned—chloroform.

ART. XIX.—*On Caries of the Spine and its Treatment.* By WILLIAM A. ELLIOTT, F.R.C.S.I.; Surgeon to the Whitworth Hospital, Drumcondra; Member of Council R.C.S.I.

FROM a number of cases of caries of the spine which have come under my observation, I select the following one, as being not only an excellent example of the obscurity in which the symptoms of this disease are frequently involved, but also as proving the good result to be derived from a mode of treatment which I have been in the habit of employing for many years, and which I purpose particularly to describe in this paper.

On the 30th April, 1866, I was requested to visit Master R. H., aged five years and three months, a most intelligent child, with clear, delicate skin, brown hair, and very dark eyes.

Upon examination I found the little patient very much emaciated

and his strength greatly prostrated, with haggard and painful expression of countenance. Pulse 120, small and compressible. Tongue comparatively clear and moist. Bowels generally constipated. Appetite capricious, and the quantity of food daily taken but trifling. He complained of pain upon the slightest bodily movement, which was not referable to any particular part, but extended generally over the parietes of the abdomen and thorax.

The upper and lower extremities were greatly wasted. The former he moved with freedom, but when asked to draw the lower limbs upwards, and then to extend them, these motions were accomplished slowly and deliberately, more as if the child were afraid of producing pain than as if unable to perform the act.

It was impossible to place or support the patient either in the erect or sitting postures without causing pain.

When turned upon his face I perceived a sharp angular projection corresponding to the spinous processes of the fifth and sixth dorsal vertebræ, pressure upon which produced no pain. The back had a peculiar rounded appearance. The head and shoulders drooped considerably forwards, and produced in front a corresponding concavity of the chest. The particulars of the patient's case were given to me by his parents as follows:—

When the child was about the age of three years the first symptoms observed were languor, accompanied by general uneasiness and stiffness, which were soon followed by pain upon any attempt at moving or turning in his bed. He became cross and irritable, had very disturbed rest at night, and awoke in the morning unrefreshed and weary. His appetite gradually declined, and it was with difficulty he could be prevailed upon to take nourishment sufficient to sustain him.

The patient was kept in the recumbent position for about fifteen months, yet with a slow and gradual increase of all his symptoms and sufferings, when he began to refer the chief seat of pain (which became very acute and occurred at short intervals) to the abdominal region, particularly the lower part, from whence, after some weeks, it extended upwards towards the parietes of the thorax, and subsequently backwards in the direction of the diseased vertebræ. From the commencement of the child's illness he was constantly under medical surveillance, but particularly so during the year previous to my visiting him, as his symptoms had become much more urgent. His mother, who had sole charge of him through the entire of his illness, represented her child as being in constant pain

and misery, chiefly at night, when frequently she was compelled to remain at his bedside for some hours.

As the principal seat of pain was referred to the abdomen, the medical attendants directed their attention particularly to that region for nearly twelve months. Anodyne stupes and poultices were frequently applied, and small anodyne draughts given occasionally at night when required to alleviate pain, but without producing any permanent relief. The constitution was supported by means of tonics, and by every description of diet that could be suggested. The bowels were relieved occasionally by enemata, which, however, produced so much discomfort to the child that they had to be discontinued.

Treatment.—From the foregoing history of this case the first indication in the treatment was obviously to alleviate the patient's suffering.

I therefore ordered a well-fitting corset to be made, stiffened with whalebone, which was speedily applied, and after it was worn for a few hours the child derived much relief. The body being thus gently supported, he was enabled to turn and move in his bed with more freedom and comfort. I also prescribed the following medicine:—

℞. Muriat. morphiæ, gr. i.
Syrupi Limonis, ʒi.

A tea spoonful to be given at night, and repeated at intervals of three or four hours if suffering from pain or restlessness.

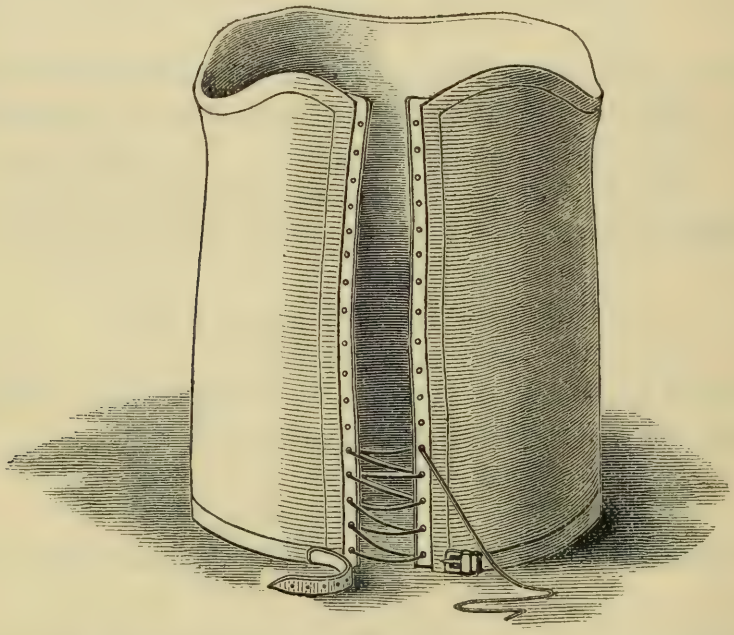
℞. Vini Ferri.
,, Rhei aa. ʒi.

A dessert spoonful to be given occasionally should the bowels be constipated.

This mode of treatment was steadily pursued for three weeks with most decided benefit. The pain gradually diminished; patient's sleep became more undisturbed and refreshing, and there was a corresponding improvement in his general health and strength. Notwithstanding this amendment there still existed an amount of lingering pain, which, although much diminished, became at intervals sharp and distressing. The corset having ceased to afford the requisite amount of steadiness to the body, I applied the stronger support which I am in the habit of using, the description of which and mode of application I shall briefly state.

The support consists of thick leather (known as tanned but not

curried), which before using must be well soaked in tepid water; by this process it is rendered soft and pliant. The leather may then be cut so as nearly to close in the front, and made to extend from the axillæ downwards over the cristæ ilii. It is then to be applied firmly round the body by means of a long circular bandage, so as to embrace the parts accurately. It may then be left on for some hours, until the leather has become quite hard and dry, when it may be removed, and will be found to have taken the exact shape of the body. This mould should then be more accurately cut so as to make it fit evenly, and subsequently lined with chamois leather and made to lace up the front, with strap and buckle, to secure it round the pelvis, as represented in the accompanying figure.



This simple appliance having been perfected I placed it upon the patient; in a few hours afterwards the pain became very slight, and at the expiration of less than three weeks it had totally subsided, and he could then sleep comfortably in whatever position he wished to assume.

For three months the child was kept as much as possible in the recumbent posture, and finding his general health and strength much improved I applied strips of the emplastum plumbi (spread upon thick sheepskin) closely to either side of the angular projection, for the purpose of making moderate pressure upon the prominent parts. This was effected by means of the leather

support, which was worn by day and by night, and never removed except for the purposes of ablution. It now became almost impossible to make the patient observe any particular position, and with this returning strength was evinced the greatest desire to assume the erect posture. I therefore allowed him to use crutches, upon which he was able to move gently about the room. I have nothing important to state respecting the treatment of this case for the last five months. It consisted merely in strict observance of the management which I have already described, and which was carefully carried out under my observation.

I adopted no local application of iodine, or counter irritation of any description. My attention was directed to the improvement of the patient's health, and, as far as possible, to enforce an observance of the recumbent posture.

I frequently visited the patient for the purpose of adjusting the strips of plaster, and making alterations in the leather support, which it was important to attend to according as the spine underwent alteration in its shape. This was simply done by damping the leather with water, and re-applying it by means of a bandage, so as to accommodate it to, and keep it in closer proximity with the spine.

At the expiration of eight months from the period of my first seeing the patient, a most interesting and important improvement had taken place in his symptoms, both locally and constitutionally. The sharp angular projection which formerly existed had become gradually more obtuse, until ultimately it presented merely a curved outline.

The following dates will mark the intervals of time at which important changes took place during the treatment, and my notes, which were taken at each period, will explain the progress of the case:—

1st August, 1866 (being three months from the period of my first seeing patient).—He was able to move about a little on crutches.

1st January, 1867.—Visited him this day. His general health and strength are greatly improved. He walks about (aided by crutches) with much more ease, and is able to take somewhat more exercise; shape of spinal column much improved.

1st May, 1867.—Health still improving. He can walk about without crutches, but ordered that he should not be allowed to do so.

March, 1868.—Patient is now able to walk about with perfect ease with the leather support (which he has constantly worn) without the aid of crutches, and his amusement is that of throwing and kicking a ball about the room. Upon removing the support he moved about with almost the same amount of ease and comfort as when he had worn it. His general health improved, and the entire muscular system better developed, particularly the lower extremities, which have become comparatively well developed, and have assumed a healthy tonic condition.

Caries of the spine is a disease which has engaged the anxious consideration of most practical surgeons. The frequency with which it is brought under our notice, and the difficulties attending the curative treatment, are such as to recommend the subject to the particular attention of the profession.

Little has been appended to our pathological knowledge of this affection since the writings of the late celebrated surgeon, Percival Pott, to whose elaborate research we are indebted for the first description of this disease, with the importance of which he was fully impressed, and has thus graphically alluded to it as an ailment—

> "In an infant, most melancholy to see;
> In an adult, most miserable to endure."

The treatment of caries, in whatever part of the spinal column the disease may be seated, will generally be found necessarily to consist of constitutional, local, and mechanical means, varying according to the health and condition of the patient, and the stage at which the disease may have arrived. The constitutional treatment should be generally of a tonic character, the indications for carrying it out are comparatively simple, and may be regulated according to circumstances. The local and mechanical treatments are attended with somewhat more difficulty; and respecting these there has, and still does exist, some difference of opinion.

We usually find this disease either resulting from or accompanied by a debilitated state of the system. Yet in the majority of instances it is met with in patients of strumous diathesis. It is difficult to limit the period of life at which this affection may invade the system. I have met with it at different ages, varying from infants of a few months old to persons of nearly forty-five years. Whatever the age of the patient may be, the indications for our treatment will be found alike in all, requiring, however,

modification according to the age and particular condition of the individual.

Pott considered this disease as strumous, and he strongly advocated and adopted the use of issues, and recommended not only that they should be kept open, but that the discharge from them should be copious and long-continued.

Sir Benjamin Brodie states that caries of the spine usually occurs in those who are either originally of a weak constitution, or whose bodily powers have become diminished under the influence of some previous ailment, and recommends issues to be applied either by means of caustic or the actual cautery, which treatment should be accompanied by absolute rest, all movement of the carious vertebræ being avoided. In the later years of his practice, however, he to a great extent abandoned the use of issues, and placed his chief reliance on rest and constitutional treatment.

The late Surgeon Abraham Collis, in his observations on the treatment of caries of the cervical vertebræ, recommends the use of issues, and, in his usual clear and practical style, gives the following opinion of their action:—"Caustic issues do well at first, acting immediately with benefit, but after this it is not of much service, unless you renew it, or irritate its surface twice in the week. I therefore do not think much good derived from the constant discharge, but that more is to be expected from the repeated irritation."

Sir Astley Cooper, in his lectures on this subject, has thus expressed his opinion respecting local irritation:—"Blisters, setons, and issues are commonly employed, but they do more harm than good by the irritation which they excite in the constitution." But, as a curative measure, he adds: "The means on which you should chiefly rely are rest, and the recumbent posture."

Having devoted a considerable amount of attention to this subject, and having carefully tested the various modes of treatment which have been suggested by eminent authorities, I have seen but little, if any, benefit resulting from issues or counter irritation, except when adopted in the incipient stage of the disease, before the tissues have undergone structural alteration, and before the constitution has become debilitated under the wasting influence of the disease.

In the early stage of the affection, I have inserted issues by means of caustic potash, and have witnessed most satisfactory results from them. Whether the benefit should be attributed to the powerful counter irritant action of the caustic, or to the

discharge which it subsequently produced, I cannot positively state, but my impression is in favour of the former.

In the more advanced stages of the disease, when we find considerable angular projection of the spinous processes, or in the still more formidable progress of the ailment—*i.e.*, when symptomatic abscess has formed—local irritation can avail nothing. We must, then, rely upon keeping the diseased parts as much as possible in a state of quietude.

In whatever situation the abscess may present itself, when fluctuation can be easily felt near the surface, and before the skin has become thin and pervaded with a blush of redness, I have always adopted the safe and simple mode recommended by Abernethy, of giving exit to the matter through a valvular opening made by a sharp, strong, and rather broad lancet, the point of which, if smeared with oil, will enter painlessly and freely into the sac. If gentle pressure be steadily made with the hand over the surface of the abscess during the operation, and as long as the matter continues to flow, no entrance of air need be apprehended. When the opening has been closed, a small piece of dry lint should be placed over the wound, and kept in situ with adhesive plaster. A bandage should then be applied round the part so as to keep the parietes of the sac as much as possible in apposition. These constitute all the precautionary measures which I have found necessary.

The great advantages which this mode of operation possesses are its simplicity, safety, and exclusion of air from the sac. I have repeatedly performed it, even as often as five or six times in the same individual, and have never yet met with any evil consequence to result from it.

Whatever differences of opinion may exist respecting the local treatment of this disease, all surgeons are unanimous with regard to the necessity of directing attention to the general health of the patient, and of preventing, by every possible means, any motion of the diseased vertebræ. The maintenance of that state of quietude, which even during sleep is so essential to the recovery of patients labouring under this affection, is a difficulty with which we are familiar, and which we have found hard to overcome.

I have seen many nicely-made and ingeniously contrived instruments used for this purpose, but they seemed signally to fail in fulfilling the necessary indications. I must acknowledge that I have never met with any instrument or contrivance which, in my

experience, has so fully answered the purpose as the leather support which I have described. The practical advantages to be derived from its use may be summed up as follows:—

1st.—From the accuracy with which it can be made to fit the body, combined with its lightness and strength it will be found to afford comfortable and substantial support, and it will prevent motion in the affected parts, even during sleep. In the erect or sitting postures it will tend to relieve the diseased vertebræ from the weight and pressure of the superincumbent parts of the body.

2nd.—Local treatment, when necessary, can easily be conducted during its use by simply making apertures in the leather, wherever they may be required.

The following abstract of a case of cervical caries, already published (in greater detail) in the *Dublin Medical Press and Circular*, will more fully exemplify the advantages to be derived from the mode of treatment which I have suggested:—

Margaret Lynch, aged seven years, was admitted into the Whitworth Hospital, Drumcondra, on the 29th of April, 1856. The child, who was badly nourished and emaciated, presented the following appearances:—The head (as exhibited in Fig. 1) had fallen completely to the left side, with an inclination forwards.

Fig. 1.



The right side of the face was turned upwards, and was much

congested from impeded circulation. The cheek rested upon the left side of the chest, and advanced so far downwards and forwards as to reach within about two inches of the nipple. The chin had passed the mesial line of the thorax, and advanced as far as the junction of the middle with the sternal third of the right clavicle.

The posterior aspect of the patient (represented in Fig. 2) exhibits the head as thrown to the left side, and resting upon the top of the shoulder. The spinal curvature, with its convexity

Fig. 2.



looking towards the right side, occupied the entire of the cervical region, although, to the best of my judgment, I could only localize the disease as existing in the third, fourth, and fifth cervical vertebræ.

When about the age of six years, whilst playing roughly with her sister, the child received a severe twist in the neck, which was immediately followed by faintness; and afterwards she complained of stiffness and pain in the part, the pain being greatly increased upon the slightest movement of the head or neck.

She suffered, at intervals of about three months, from inflammatory attacks, each being followed by a more gradual inclination of the head and neck to the left side.

The principal symptom she complained of was a constant aching pain in the upper part of the neck, increased by making pressure

upon the vertex and along the spinous processes, but greatly aggravated by the slightest attempt to rotate the head and neck.

In the recumbent posture she seemed to rest with comparative ease; but when asked to sit up the effort was made by first firmly grasping the head with both hands, and then the act was accomplished with no small amount of difficulty.

In the erect posture the child rested her head upon the left shoulder; but when desired to raise the head she could only do so to a very trifling extent, say to half an inch or three quarters, and this position could only be maintained for a few seconds.

When asked to walk, she instinctively raised the top of the shoulder, and placed it against the ear and side of the head. An amount of support was thus afforded, which enabled her to move slowly and cautiously about.

The treatment adopted consisted of constitutional, local, and mechanical agents, viz.:—She was ordered full and generous diet; iron combined with quinine, varying at intervals with other tonics, and cod-liver oil at night.

Counter irritation was constantly kept up in the neighbourhood of the diseased vertebræ by means of small blisters, alternately, when the parts were healed, with applications of tincture of iodine.

The child was strictly kept to her bed, with the head and shoulders slightly elevated. This course was steadily pursued for six weeks, when a visible improvement had taken place in her general health, accompanied with almost complete subsidence of pain in the neck.

The case having thus far satisfactorily progressed, and, fortunately, without any formation of abscess, I ventured upon the gradual restoration of the head and neck to their normal positions by adopting the following means:—

I placed a soft but firm pad, three-quarters of an inch in thickness, between the maxilla and the chest (which was the maximum extent to which the parts admitted of separation). This pad was very gradually increased in thickness, until the head became so far elevated as to admit of a collar made of leather, one inch in height, to be so applied as to encircle the entire neck, which was worn by day and night.

The child became accustomed to the use of this support after three or four days, when I allowed her to get up and walk about the ward. Of this permission she gladly availed herself, and seemed to derive much comfort from the collar, which was raised from time

to time at the left side, and under the chin, by means of strips of thick chamois leather, pasted one over the other upon the upper edge of the collar, until the head and neck were brought to the position represented in Fig. 3.

Fig. 3.



The head and neck having been restored to their normal positions, and the child's health being much improved, I gave permission for her removal from the hospital at the latter end of December, 1856 (being eight months from the time of her admission), with directions to have the collar kept constantly on.

In three weeks after the patient's discharge from hospital she presented herself at the dispensary, when I was disappointed at finding her general health very much impaired; she seemed weak and languid, and had become much thinner. Her constitution had suffered considerably from want of care and suitable nourishment, with which her parents were, in all likelihood, unable to supply her. She was, therefore, re-admitted on the 15th of January, 1857, and kept in hospital until the 20th of June following, when she was discharged cured.

I have had frequent opportunities of seeing Margaret Lynch since the above date. In July, 1867, I examined her, and made the following notes of her case:—

This little girl is much altered in appearance; she has grown strong, her figure well developed, and her general health good. There is some amount of rigidity in the neck, accompanied by deep-seated thickening of parts commencing from about the third

to the fifth or sixth vertebra, which indicates that anchylosis to a greater or less extent has taken place, with some apparent shortening of the neck.

The motions of the head and neck are, in a very trifling degree, impeded; she can fully bend the head forwards. Lateral inclination at both sides is in some measure limited; she can throw the head sufficiently far backwards, as to enable her to look almost fully and freely upwards, without any compensatory movements in the dorsal or lumbar regions.

I may fairly say, however, that close observation is necessary to detect any existing difference from the normal motions of the cervical region.

The cases which, in my experience, have been successfully treated, according to the foregoing system, have occurred in children between the age of three and ten years, in whom I have found the head and neck thrown into various positions—viz., laterally and forwards, with torsion of the neck; laterally, with different degrees of inclination; forwards, with the chin resting upon the sternum; and backwards, with convexity of the spine anteriorly. This latter form of the disease I have found much more intractable in its management than any of the former.

In each case of recovery no symptomatic abscess existed. I have attempted this mode of treatment even in patients who were suffering from purulent discharges, but soon desisted, finding that all such interference was fruitless, and productive rather of evil than good results. They were however persons of eminently strumous diathesis, and consequently unpromising subjects for any mode of treatment.

We cannot expect that each case of recovery can be perfect and unaccompanied with deviation from the normal formation of the neck. In Margaret Lynch's case the disease occurred in an extremely aggravated form; and although her recovery was unattended with deformity, other patients, with less formidable symptoms, have recovered with slight malposition of the neck, evidently resulting from absorption of bones and possibly of intervertebral substances.

We find it difficult in spinal caries to define the exact extent of the disease, and what structure has been the primary seat of inflammatory action. It may have its origin in the intervertebral substances, or in the cancellous tissue of the vertebræ, which latter may be considered the strumous form of the disease, and most likely to be followed by the formation of matter. But, as the disease advances, both structures may become implicated.

The direction towards which the head and neck will become inclined (should the disease not be arrested) will be determined by that part in which the morbid action exists. To this situation the head will invariably be found to lean.

It may be suggested, and it occurred to my mind at first, the prudence of interfering by mechanical means in restoring the shape of the part by raising the head and neck, and thus keeping apart the inflamed and ulcerated surfaces of bone and intervertebral substance. Such interference might seem a positive obstacle to the formation of anchylosis, and somewhat at variance with the opinions of systematic writers upon this subject. Yet experience justifies me in stating that whilst the curative process of anchylosis is progressing, the restoration of parts to the normal position may contemporaneously be conducted with the utmost safety and benefit to the patient. When caries occurs in any part of the spinal column it is invariably accompanied with a debilitated condition of the general system; therefore it is manifestly important to attend strictly to hygienic treatment if we hope for successful results.

In caries and other affections of the neck attended with contractions, I have practically experienced the great utility of the leather collar to which I have already alluded. It forms an important mechanical adjunct to our treatment. When properly shaped the lower edge should be made to rest upon the sternum and clavicles, whilst the upper edge should, with equal accuracy, be adjusted and brought in contact with the inferior maxilla and occiput.

The indications fulfilled by this support are obvious, viz.:—

1°. Having fixed points for the collar to rest upon, the superincumbent weight of the head is thereby in a great degree removed from the inflamed and diseased tissues.

2°. Mobility of the parts is rendered greatly limited.

3°. The collar affords an amount of passive resistance to the action of the cervical muscles, the contraction of which must be attended by a closer approximation of the diseased and softened surfaces, thereby promoting a more rapid absorption of bone and intervertebral substance.

4°. There is no necessity for constant confinement in the recumbent posture. When the collar has been applied patients may be allowed occasionally to walk about and enjoy open air exercise, which is not the least important advantage to be derived from the mode of treatment which I have suggested.

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

1. *Essai de Pneumatologie Médicale, Recherches Physiologiques, Cliniques et Therapeutiques sur les Gaz.* Par J. N. DEMARQUAY, Chirurgien de la Maison Municipale de Santé et du Conseil d'état, &c. Paris: J. B. Bailliere et Fils. 1866. Pp. 861.

Essay on Medical Pneumatology. By J. N. DEMARQUAY.

2. *The Action, Use, and Value of Oxygen in the Treatment of Various Diseases otherwise Incurable or very Intractable.* By S. B. BIRCH, M.D. London: John Churchill and Sons. 1868. Pp. 149.

M. DEMARQUAY tells us, in his introduction, that the object of his essay is twofold—to describe those diseased conditions in which there is development or accumulation of gas, and to give an account of the therapeutic application of gases. He commenced his investigations some years ago in conjunction with M. Lecarte, pharmacien en chef to the hospital to which he is attached. They endeavoured to ascertain the chemical and physiological action of gases injected into the closed cavities and healthy tissues of animals, to observe the influence of gases on the repair of tendons divided by subcutaneous incisions, and on the healing of exposed wounds, and the results were published in *Les Archives Générales de Medicine* for 1859 and 1862. Subsequently M. Demarquay continued his investigations alone, and tells us, in this volume, the conclusions at which he arrived.

The first twenty-six pages are devoted to a review of the opinions which have from time to time been held as to the existence in the blood and use of oxygen, carbonic acid, and nitrogen. As to the first, after noticing the views of Dumas, Longet, Claude Bernard, and other physiologists, he finally gives his adhesion to

the following conclusions, which he quotes from an unpublished work on anemia, by M. G. Sée:—

"*A.* The corpuscles are the carriers both of the oxygen which exists in the blood in combination with iron, and of the oxygen which is present as active oxygen or ozone.

"*B.* Their diminution entails the following consequences:—

"1. A functional alteration in the organs which, as the muscles, use the largest quantity of oxygen for the performance of their functions.

"2. Sensibility is blunted.

"3. The nervous centres are disturbed.

"4. Temperature is lowered because combustion is less active.

"5. The respiratory functions are deeply disturbed, the necessity for breathing being great, and the gaseous exchanges imperfect.

"6. The innervation of the heart is disturbed."

Part of the carbonic acid in the blood exists in union with the protoxyde of iron, but part also is held by the serum: as Lavoisier maintained, the amount of oxygen absorbed is in excess of that which is required for the formation of the carbonic acid exhaled, the balance uniting with the hydrogen contained in the constituents of the blood to form water. In what form nitrogen exists in the blood remains unsettled, and contradictory accounts are given by the various experimenters who have sought to determine the effect of respiration on the nitrogen of the atmosphere. The conclusions, however, of Regnault and Reiset are now generally received. They found that while healthy animals subsisting on the food proper to them exhaled a very small quantity of nitrogen, animals deprived of food, or supplied with unsuitable aliment, or labouring under illness, absorbed a small quantity of nitrogen from the surrounding air; in other words, under normal conditions the blood draws its nitrogen from the processes going on within the organism.

The author then proceeds to consider the conditions under which gases have been found in blood-vessels, in the gastro-intestinal tract, in the cavities of the uterus and bladder, and in certain abscesses of the abdominal walls; and afterwards devotes above two hundred and fifty pages to the consideration of the various lesions which may give rise to general emphysema, and to the existence of air in the pleura, pericardium, peritoneum, tunica vaginalis, and in joints.

It was on account of the third portion of the book that we took it up with interest, and have read it with care. We think that gases may, perhaps, become valuable remedial agents, and we were, therefore, anxious to hear the results of an investigation into their therapeutical applications.

The first to which he directs attention is carbonic acid. He begins by giving us an historical *resumé* of the opinions which have been held as to its value by Von Helmont, Robert Boyle, Hales, Black, Cavendish, M'Bride, and others. He then devotes sixty pages to an examination of the physiological action of carbonic acid. He refers at length to the investigations of others, both in later years and in the last century, and details his own experiments, made first on animals, and subsequently on his pupils and himself, and finally sums up in the following conclusions:—

"1. Carbonic acid exerts on the surface of the body an action exciting in proportion to the delicacy and susceptibility of the skin. When persons are exposed to an atmosphere of it the genital regions are specially the seat of this action.

"2. Anesthesia of the skin, when produced, only occurred under the influence of a continuous jet played upon a very limited portion of the body.

"3. Its action, when locally applied to the organs of sense, the eye and ear, resembled its general effect; there was excitement, exalted sensibility, a nervous perturbation, all the phenomena being, as a general rule, transient.

"4. Given in the form of aerated waters and otherwise, its effect on the digestive organs was stimulating, and with this was associated slight neuro-vascular excitement.

"5. Injected into the veins of animals it is absorbed in great quantity and rapidly eliminated, if the operation be conducted with suitable precautions; if injected rapidly it acts mechanically, producing distension of the cavities of the heart, and death.

"6. Introduced into the system by the respiratory organs it does not produce the poisonous effects which have been attributed to it. An atmosphere composed of one part of carbonic acid gas to three or four of air or oxygen can be respired by the lower mammals for a considerable length of time without apparent inconvenience. In man it produces some disturbance, but only after it has been inhaled for a period longer than would be necessary for its use as a therapeutic agent. The appearances, when death has resulted in men or animals from immersion in carbonic acid, bear no resemblance to those which are met with when carbonic oxide has been breathed.

"7. Most of the accidents from charcoal burning, and from descending into vats which have been attributed to carbonic acid, were really caused by carbonic oxide, sulphuretted hydrogen, or alcoholic vapour.

"8. Carbonic acid is simply irrespirable. Respiration essentially consists of an exchange of gases. This exchange, in accordance with physical laws, can only take place between gases of different kinds; the respiration of pure carbonic acid, therefore, places an obstacle in the way of the pulmonary function, and produces asphyxia.

"9. In man it seems impossible to produce anesthesia by the inhalation of carbonic acid without danger of asphyxia."

Proceeding to the use of the gas in the treatment of disease, M. Demarquay begins with continued fevers, but his facts are entirely derived from the writings of M'Bride, Priestley, Hey of Leeds, Dobson, and other authors of the last century, who, attributing, in accordance with the pathology of their time, continued fevers to a species of putrefaction, and believing carbonic acid to be an antiseptic, gave it by the mouth in effervescing draughts, and injected it into the bowel, as they believed, with good effect.

The use of the gas in pulmonary complaints—in phthisis, and in asthma—next engages the author's attention; and here we confess to extreme disappointment at the discovery, that he had no observed facts of his own to give us on this subject either. Instead of these, he hazards the conjecture that the reputation which certain methods of treating phthisis have from time to time enjoyed, arose from their exposing the patients to an atmosphere containing an unusual amount of carbonic acid. In this way he explains the good effects produced by the treatment of a Spanish physician, who buried his unfortunate patients up to the throat in newly-dug earth for some hours daily, and the cures which are said to have followed residence in a byre. He gives us extracts from Percival and Dobson on the use of fixed air in pulmonary complaints, and quotes cases recorded by physicians practising at various mineral springs, which are rich in carbonic acid, on the efficacy of their waters.

Proceeding to the topical uses of the gas, he gives us again an historical account, quoting the opinions of Percival, Hey, and others. In 1859 he had himself arrived at the following conclusions:—

"1. Carbonic acid gas, injected under the skin, has no poisonous effect.

"2. It promotes the reparation of divided tendons, and the healing of subcutaneous wounds.

"3. Grangrenous ulcerations and diphtheretic sores healed rapidly under its use."

He envelopes the limb to which he wishes to apply it in a caoutchouc bag connected by a tube with a reservoir containing the gas, which is allowed to flow in upon the limb for four or six hours at a time. A feeling of heat and tingling is experienced, especially at the sore, the surface of which becomes injected and covered with exudation, while the surrounding skin is bathed in perspiration. He has confined its use to old and rebellious sores; but these, he says, clean rapidly under its use, assume a healthy colour, their edges sink down, and cicatrization begins. In open cancer of the mamma, the uterus, and other parts, he has found the gas a palliative of the utmost value. The day after its application, he says, discharge becomes less fetid and copious, pain is lessened, and even partial cicatrization has followed its use. In these cases the gas is applied as a douche three or four times daily for ten minutes at a time. Its application to the uterus has sometimes caused so much excitement that it had to be given up, but it never produced, in M. Demarquay's hands, the severe nervous symptoms which others have attributed to it. In thirty cases of rebellious sores of the lower extremities he used it with results which he considered satisfactory. He mentions having treated two ulcers of the tongue—one of them syphilitic—with gargles of Seltzer water, which contains a considerable quantity of the gas: they very soon became painless, and healed under its use. The waters of Nauheim are rich in carbonic acid, and he quotes M. Rotureau's account of their efficacy in deafness from chronic affections of the meatus auditorius, in keratitis, and other inflammations of the eyes, and in affections of the nasal fossæ.

Neuralgia and catarrhal affections both of the male and female bladder, he has treated with good effect by injections of the gas. On one ocasion, however, the bladder gave way, and the gas was effused into the peritoneal cavity without, he tells us, the least unpleasant consequences—a result we can hardly understand, however innocent his favourite remedy may be, we cannot conceive that the rent made in the coats of the organ would fail to permit the escape of urine; at all events, those who may feel disposed to try his treatment should, we think, do so with the utmost care. Douches of carbonic acid gas, and of eau de seltz, he has found

useful in amenorrhea and dysmenorrhea, and uterine catarrh; and he quotes for us the marvellous cures of these ailments, which have been published by the bath doctors at some of the German spas which are rich in the gas.

M. Demarquay next treats of oxygen. He first gives us an historical account of this gas, attaching much importance to the work of Beddoes. He considers that the results obtained by the use of the compressed air bath in the hands of Pravaz, Junod, and Bertin may be attributed in great part to the oxygen. Though the experiments of the physicians of the last century are wanting in precision, they nevertheless, he believes, justify the conclusion that oxygen is a powerful therapeutic agent. We must remember that without it the various tissue changes could not take place, and it is therefore likely to prove a valuable addition to our means of influencing disease. He believes it is possible to increase the oxidizing process in the body by exercise, by fresh air, by compressed air, or directly by the inhalation of oxygen. He caused dogs, on the front of whose chest he had established a sore, to inhale the gas, sometimes pure, and sometimes diluted with atmospheric air. Subsequently he administered it by inhalation to men on whose bodies there existed granulating ulcers. In both, he tells, he observed, after the inhalation had been continued for some minutes, a marked injection of the capillaries forming the granulations, a copious exudation of serum or plastic lymph, and, if the experiment were continued for twelve or thirteen minutes, ecchymosis or actual oozing of blood took place. Blood drawn from the femoral vein of one of the dogs during the inhalation preserved its ordinary temperature, and there was no elevation of temperature during the experiment. Injected into the cellular tissue and serous cavities of animals no ill effects were produced, and it was rapidly absorbed. Rabbits confined in an atmosphere of pure oxygen lived for a longer period than when confined in an equal volume of atmospheric air, but finally died, and as the reservoir was found still to contain a considerable quantity of oxygen, it was evident that their death was not due to their having exhausted it. After death there was extreme vascularity of the tissues, especially of the muscles, which were of a bright red colour. The blood in the veins preserved its venous hue, but became red with unusual rapidity when exposed to the air, and maintained its fluidity for an unusual length of time. He quotes the experiments of Beddoes, who found that animals which had

been made to breathe an atmosphere of oxygen bore immersion in water for a length of time, which caused the death of others which had been breathing ordinary air. M. Demarquay also injected oxygen into the veins of animals. If the injection was performed too rapidly it caused death just as when air enters veins; but if done gradually, it was absorbed, and open wounds underwent the same change which had been noticed when the gas was inhaled: no matter, however, what quantity of oxygen was injected no alteration in the colour of the venous blood ensued. When thrown into the vena portæ, the spleen became distended, of a brilliant red colour, and firm, though the other viscera retained their normal appearance. M. Demarquay has himself inhaled, and has administered to his pupils and patients, ten to thirty litres of the gas without any injurious consequence. The effects varied in different persons: a sensation of heat in the mouth, chest, and stomach was commonly experienced; the pulse became quicker and harder than natural; sometimes sweating took place, sometimes a feeling of intoxication, and other indications of disturbance in the nervous centres was produced; in some there was a desire for muscular exertion, and in nearly all there was increase of appetite. Altogether, the effects greatly resembled those of the compressed air bath, for which, therefore, he thinks the inhalation of oxygen may be substituted. He dwells on the necessity of seeing that the gas is pure. He develops it by heating chlorate of potass, which has been mixed with an equal weight of fine dry sand, and it is made to pass through milk of lime. From twenty to thirty litres may be used daily, half in the morning and half in the evening. The patient simply draws it from the reservoir through a tube, sufficient atmospheric air entering through the nose. During expiration he holds the tube firmly, and removes it from the mouth so that the expired air does not enter the reservoir. Dry oxygen he has found too irritating, and he therefore advises that water should be present in the reservoir. In anemia, where iron fails, he recommends oxygen. Trousseau has found it useful in asthma. M. Demarquay believes seizures may be averted by it. He does not advise its use in phthisis, except in the very early stage, when it may be useful in promoting appetite. In his own practice he says he has seen it produce excellent effects. In phthisical dyspepsia he has also known it useful, though more rarely in advanced cases. In dilatation of the bronchi, and in enlargements of the cervical and bronchial glands, he has seen it

do good. He figures a convenient apparatus made by M. Galante, for the inhalation of gases, which those who may feel disposed to try this mode of treatment would do well to procure. The same manufacturer has constructed muffs of vulcanized caoutchouc for the application of the gas to the limbs. Under its topical use M. Demarquay has seen the congestion surrounding senile gangrene, and the redness of chronic eczema, disappear, and unhealthy ulcers assume a healthy aspect. It is not so exciting to wounds as carbonic acid, but violent inflammatory action may be produced if it is continued for nine or ten hours. A hydrocele, after injection by oxygen, underwent a cure. Thrown into the bladder, the gas did no harm. The pains of senile gangrene were in one case lessened by the application of carbonic acid, and in another by that of oxygen; but in other cases no good resulted. In two cases in which the anterior and posterior tibials remained open, and the gangrene seemed due to disease of the capillaries, relief of pain, restoration of the capillary circulation, disappearance of the violet colour of the limb, and ultimate cure, resulted. The inhalation of fifteen to twenty litres of oxygen (twenty-six to thirty-five pints), pure or mixed, with an equal quantity of atmospheric air, night and morning, a little before meals, M. Demarquay has found very efficacious in restoring appetite and strength to anemic and dyspeptic patients under treatment for various surgical diseases, especially in those who, in spite of tonics and nourishment, were sinking after operations. He also speaks of its value in those who are liable to hemorrhages from diseased surfaces in the uterus or elsewhere, and in persons whose general health requires improvement preparatory to the performance of some operation. He has also used oxygen inhalations, along with its local application, in the treatment of rebellious and scrofulous sores, and quotes at length a case in which its use had been attended with the best results in syphilitic disease of the most intractable character. He found, however, that if administered in doses much larger than those he recommends, though the appetite became ravenous, the patients grew thin. In the anemia and dyspepsia of cancerous disease, and of maladies of the genito-urinary system, it has also proved in his hands useful. He quotes the opinion of Odier of Geneva, with which his experience coincides, who, writing in 1799, lauds the use of water, into which oxygen had been forced, in hysterical and melancholic affections, in tedious convalescence, in asthmatic cases, and as a dieuretic in dropsy with ividity and oppression.

To nitrogen the author devotes but a few pages. He found that recent wounds became painless when surrounded by an atmosphere of that gas; and the inflammatory process which results when atmospheric air is admitted, and still more actively when they are in contact with oxygen, failed to come on. He hopes, therefore, that the local application of nitrogen may moderate inflammatory reaction in wounds, and cause union by the first intention. Surrounding recent wounds with an atmosphere of hydrogen stopped all reparative action, apparently by producing turgescence of the veins. The inhalation of a mixture of four-fifths of hydrogen, with one-fifth of oxygen, appears to have proved successful in phthisical patients who were suffering from loss of sleep.

As to protoxide of nitrogen, which has, since the publication of M. Demarquay's book, attracted so much attention, he has no personal experience to furnish, but quotes the accounts given at the time of the experiments of Sir H. Davy; and this leads us, in conclusion, to express our regret that the author of the treatise before us has devoted so much of his book to rather wearisome historical accounts of the therapeutic agents of which he writes. Without wishing to detract from the merits of the philosophers of the last century, we cannot help thinking that a few carefully conducted experiments, made in the light of the knowledge of the present day, and with the appliances we possess, are of such incomparably greater value than their speculations, that the time spent by M. Demarquay on the literature of the subject might more profitably have been devoted to its experimental investigation.

Dr. Birch details thirty-one cases of various kinds of ill health in which he found oxygen useful. In acute inflammatory and febrile diseases, valvular lesions of the heart, diseases with increased fibrin in the blood, if accompanied by relative diminution of the other organic constituents, and deterioration of the red corpuscles, he considers oxygen useless or injurious, as well as in "that permanently lowered condition induced by long-continued, insidiously-undermining nervous debility (so well known to us all), which, having become almost a second nature, has incapacitated the system for 'making life' beyond such amount as is absolutely essential for the brief maintenance of Psyche in her terrestrial abode." With these exceptions, however, he seems to have found it of singular efficacy as a therapeutic agent. Strumous and cancerous diseases, inveterate

headaches, chronic neuralgia, and various other affections of the nervous system, congestive diseases of female life, chronic derangements of liver and spleen, atonic diseases of the heart, chronic bronchitis and congestion of the lungs, asthma and pulmonary consumption, have all in his hands acknowledged the remedial virtue of oxygen. But he says: "The diseases, *par excellence*, in which the gas has afforded me the most gratification are those attended with either local or general venous congestions—a preponderance of the venous over the arterial, and torpidity of the capillary circulation." In most of the cases quoted he limited himself to oxygen gas, but generally employs other suitable remedies. Oxygenated water, when really well made, as by the process patented by Barth, ozonified oil, which was recommended by the late Dr. Theophilus Thompson, and the oxygenated bread made by Mr. Welton, of Grafton-street, London, he finds occasionally useful; but it is by inhalation that he usually administers oxygen. The following is his description of the methods of preparing and administering it which he recommends:—

"It appears to me that one of the best 'rough and ready' processes which can be recommended is the one originated, I believe, by Keller, and latterly modified by Fleitmann. A saturated (not milky) solution of chloride of lime, with a very small quantity of freshly-prepared peroxide of cobalt added, is to be subjected to a temperature of 176°; and the gas in tolerable purity comes off freely to the extent of 400 pints for each pound of the chloride. The protoxide can be added at the moment of use, quickly becoming peroxide. To extemporize an apparatus is obviously easy, and for administration a bladder can be readily attached, and some approach to accuracy thus attained in regulating the proportions of the oxygen and the atmospheric air.

"Mr. Robbins (Robbins and Co., Oxford-street), taking advantage of this process of Fleitmann, has ingeniously managed to combine and retain in dry weather the oxide of cobalt with the chloride of lime, ready for immediate use by simply adding *boiling* (so directed) water to the compound. This affords two advantages: first, the good quality of the chloride is ensured; and secondly, the trouble of making the clear saturated solution is avoided; while, with the simple inhaler devised by Dr. Beigel, the practitioner can administer oxygen at a distance from his residence, in a case of urgency, without the trouble of bulky and heavy apparatus."

"Having named the most ready means for the administration of oxygen by inhalation in cases of emergency and for limited periods, I must next draw attention to an older and more approved method which

has several decided advantages, and through which I have mainly gained my own experience of the value of oxygen in disease. I refer to the apparatus and condensed gas in iron bottles invented by Mr. Barth, of Long Acre, London. With the disadvantages of the bottles being rather liable without care to get out of order, and difficulty of easy conveyance at a moment's notice—at least in the country—there are the following great advantages:—1. The condensed gas is absolutely pure and devoid of taste and smell; and the large quantity of 120 pints is guaranteed in each bottle. 2. The apparatus is adapted for the most accurate and instantaneous measurement of due proportions of the oxygen and atmospheric air (a very important consideration, as I shall afterwards show); it is an excellent spirometer; and with it we can regulate with precision the patient's pulmonary movements, by a simple motion of the hand varying at will the pressure upon the lungs and the depth of each inhalation. As yet, I believe, nothing has been suggested equal in value to this apparatus with condensed gas, where prolonged employment of oxygen is required."

"*Undiluted* oxygen may be, and is, exceptionally useful; but, as a rule, it affords but little satisfaction, even if it does no harm. In desperate cases, as a last resource, I have tried the undiluted, after the gradually less-and-less diluted gas had failed. For one or two minutes it seemed to revive the patient; but the transient reaction has generally been followed by an immediate return and even increase of depression. It is necessary that the atoms of oxygen should be distributed through some medium; and atmospheric air is naturally selected as the best and most convenient, though nitrogen would almost equally subserve, and in some cases a medium of hydrogen (very carefully managed) affords a special advantage. The precise method of inhalation is highly important. In bad cases the inhalations (for a time, at least, at the outset of treatment) ought to be carefully watched by the practitioner. According to the special condition of the lungs, heart, and brain, &c., or the patient's physical weakness or possible nervousness, so ought the depth and vigour of the inspirations, and duration of each sitting, to be regulated. The diluted oxygen should be retained in the lungs for at least two seconds. A medium period is five to six seconds after an ordinary inspiration (say) from 70 to 200 cubic inches, according to pulmonary capacity. One minute's interval of ordinary respiration, at least should elapse between each artificial inspiration; and in some cases—either sensitive to its effects, or soon fatigued through debility—from two to four minutes' interval ought to take place. As a rule, one well-managed half to three quarters of an hour's sitting in the twenty-four hours is much more beneficial than short and repeated sittings; but of course there are exceptions.

"It is not desirable to inhale within an hour and a half after a good

meal, for obvious physical reasons, but it merits special notice that the renowned French physiologist, M. Claude Bernard, referring to the resistance to the absorption of oxygen being greatest during the act of digestion, attributes it to the superabundance of the hepatic saccharoid principle (*hepatine*, Pavy) forcibly propelled into the blood at that period. Debilitated and anemic subjects should never take oxygen after long fasting (except for a very few minutes, and when very much diluted); while the contrary applies to the plethoric and congested with plenty of reactive power, for *direct super-oxygenation* may here be received as the correct idea of the treatment with free doses, whenever ordinary oxygen cannot through physical impediments be sufficiently obtained from the air—moreover, Bernard and others have shown that the blood of animals while fasting absorbs the maximum of oxygen. The time to be occupied in inhaling a given quantity demands quite as much vigilance and judgment on the part of the medical attendant as the prescription of a dose. During the sitting all excitement should be prohibited; but after its completion active movements for a few minutes in the room or a little exercise in the open air is advantageous. Chilliness and cold feet must be guarded against, as far as possible, during the inhalations.

"In speaking of small doses, a range is implied of from two to twelve per cent. of the gas in a given amount of air. Large doses are signified by a *minimum* of twelve per cent. Nine to twelve pints of the pure gas, diluted with about seventy-five pints of air, may be stated as a fair medium dose; and the inhalation of this quantity should, *mutatis mutandis*, extend over a period of at least half an hour."

Dr. Birch is of opinion that the good effects of the inhalation of oxygen are not explicable, on the supposition, simply, that super-oxygenation of the blood or the tissues is thereby produced. He believes, rather, that the oxygen possesses a quasi-catalytic action, or, at least, enables ordinary atmospheric oxygen to be absorbed and combined more perfectly. Caution in the use of the remedy he found necessary, some persons being singularly susceptible to its influence; in them fulness in the head, faintness, and palpitation, were produced by very small doses.

SURGERY OF THE AMERICAN WAR.

1. *Catalogues of the Surgical, Medical, and Microscopical Sections of the Army Medical Museum.*

2. *Circular No.* 6.

3. *Circular No.* 7.

4. *Gunshot Wounds, and other Injuries of Nerves.* By Acting-Assistant-Surgeons MITCHELL, MOREHOUSE, and KEAN.

5. *Annual Report of the Surgeon-General, U. S. A.*, 1867.

6. *Ninety Cases of Operation for Urinary Calculus.* By PAUL F. EVE, M.D.

WE have grouped a number of books and papers which have their origin in the late American war. The first three are of great importance and value. They are issued from the Surgeon-General's department. The catalogues form a very large volume of nearly 1,000 pages, illustrated with numerous woodcuts, and some lithographs. The references to preparations are not mere dry details of classification, but give, as all such catalogues should, some insight into the nature and history of the specimens. The labour and care bestowed on this catalogue must have been enormous. The museum of which it is the key must be of immense value in its special subjects. A very large proportion of the 5,000 surgical specimens would appear to be gunshot injuries of bone. For purposes of reference to this class of injuries the book is of value even to those who cannot consult the museum. The same remark applies in a lesser degree to the medical section, which is specially rich in specimens of intestines diseased by dysentery.

The microscopical section has no special connexion with the war. It contains a description of the apparatus used for photo-micography, which is valuable to those who go in for such pursuits, but which would not be understood without the accompanying illustrations. By the report for 1867 we find that the number of specimens in the museum, actually catalogued, amounted by that time to 8,542. The papers which are of special interest are Circulars 6 and 7.

Circular No. 6 is the joint work of Brevet Lieut.-Colonel George Otis, Surgeon, U.S. Volunteers, and Brevet Colonel J. J. Woodward, A.S., U.S.A.

These titles do honour not only to the individuals who bear them, but fully as much to the State which thus recognizes the service of non-combatant officers, and puts those who strive to heal at least not below those whose duty is too often to wound and to destroy.

This circular has already attained celebrity as a work of great practical value. It seems to have been compiled as a sample of what may yet be done towards a complete history of the war in its surgical and medical aspects. We use the term history in its broadest sense, so as to include in it not only full details of all the more important injuries and diseases incidental to the war, with numerous statistical tables, but also those practical and scientific results which may fairly be derived from them. As a work of condensation this circular is marvellous, and for clearness and practical value upon the special subject it is quite unsurpassed by any previous document of equal length with which we are acquainted.

We shall extract largely from its pages, more so than we should feel justified in doing in the case of books which can be obtained by every one who chooses. These state papers, although distributed with a liberality which is quite unsurpassed, can only be accessible, as a rule, to those who live under the shadow of some public library. We therefore feel that we shall only do what the American authorities desire by assisting to make their contents known in some degree to a wider circle of readers. We take this opportunity of calling attention to the handsome donation of photographs which has lately been made to the College of Surgeons from the American Museum. One hundred large-sized photographs of the most remarkable cases, neatly mounted on card board, and with the history of each case endorsed upon it, have been sent, we believe at the suggestion of a former pupil of the College of Surgeons.

Circular No. 6 gives a sketch of the results in time to be deduced from 202 General Hospitals, containing 136,894 beds. It comprises, in the surgical section:—

Special wounds and injuries, from 87,822 cases.
Surgical operations in 17,125 cases.
Medical Staff and Materia Chirurgica.

In the medical section there are numerous valuable tables and

diagrams, which it will not be possible to summarize, together with a few practical deductions from them.

In the microscopical section there is also a description of the means used for micro-photography, also some beautiful lithographs, plain and coloured.

This circular concludes with a chapter on hospital organization and construction.

Having said thus much in explanation we shall let the volume speak for itself:—

"*Gunshot Injuries of the Head.*—In this important class of injuries the utmost pains have been taken to secure completeness and accuracy in the records. The registers have been copied by experienced clerks, and have been supervised by a medical officer. Exclusive reliance has not been placed upon the field and hospital reports; but in a large proportion of cases, specific inquiries in regard to the extent and results of individual injuries have been made by letter.

"All, or nearly all, cases of gunshot injuries of the head that have been reported to the office from the commencement of the war to October 1st, 1864, have been entered on the records. They number 5,046, and have been recorded in two classes: first, the gunshot fractures and injuries of the cranium, including the perforating and penetrating and depressed fractures, the fractures without known depression, and the contusions of the skull resulting in lesions of the encephalon; and, secondly, the simple contusions and flesh wounds of the scalp.

"It is quite possible now to establish subdivisions in the first class; but to have attempted this heretofore would have been premature, and likely to produce confusion.

"In the first class 1,104 cases are recorded. Of 704 of them, of which the results have been ascertained, 505 died, and 199 recovered. In 107 of these terminated cases, the operation of trephining was performed, of which 60 died and 47 recovered. In 114 cases fragments of bone or of foreign substances were removed by the elevator or forceps, without the use of the trephine: and of these 61 died and 53 recovered. When operative procedures were instituted, the recoveries were 45·3 per cent. But it must be apprehended that this favourable exhibit will be materially modified when a larger number of results are ascertained, and that a great proportion of the field operations of trephining, in which the results are stated to be undetermined, were lost sight of, and terminated fatally. In the 483 cases treated by expectancy, the ratio of recovery is only 20·5 per cent. But the latter group of cases includes nearly all of the penetrating and perforating fractures, and it would be unwise to base on these figures an argument in favour of operative interference.

"The gunshot contusions and wounds of the scalp that have been entered on the records number 3,942, of which 103 terminated fatally. It is altogether probable that in all of these fatal cases some undiscovered injury was done to the cranium or its contents; or that the pericranium was removed, and death of bone ensued, with consecutive lesions of the encephalon. The histories of many of these cases are now under investigation. So far as ascertained, the fatal results have depended upon concussion or compression of the brain, or upon the formation of abscesses in the liver or lungs, in consequence of inflammation in the veins of the diploe. Compression has resulted either from extravasation of blood, or inflammation of the brain or its membranes, or from suppuration. The following is an example of a scalp wound, followed by inflammation of bone and meningitis:—

"Private Joseph R——, Co. E., 151st New York Vols., received, in a reconnaissance near the Rapidan, November 27th, 1863, a gunshot wound of the scalp. The nature of the missile was unknown. The patient was removed to Fairfax Seminary General Hospital, near Alexandria. There were no cerebral symptoms at the time of his admission, and it was hoped that the pericranium had escaped uninjured. He was up, and apparently well, on December 13th, 1863, when he was suddenly seized with convulsions, which were followed by coma. Surgeon D. P. Smith, U.S. Vols., laid bare the calvaria at the seat of injury, and finding the bone diseased applied the trephine. Matter was found immediately beneath the bone, and oozing from the diploe. It was thought expedient to make five perforations with the trephine, in order to remove the diseased bone and to give free exit to pus. Convulsions did not recur, but the comatose condition continued, and the case terminated fatally twelve hours after the operation. The autopsy revealed diffuse inflammation of the arachnoid and of the dura mater.

"The foregoing case illustrates the fallacy of Pott's views in relation to trephining for pus under the skull cap; and yet, under such circumstances, the best modern authorities advise the use of the trephine as affording the patient the only chance of recovery. The records attest how slight this chance is, and corroborate the observation of Mr. Hewitt, that 'the successful issue of a case of trephining for matter between the bone and the dura mater is almost unknown to surgeons of our own time.'—Pp. 9-10.

"The Museum possesses eight examples of that rare and interesting variety of gunshot fracture of the cranium, in which the external table is unbroken, while the vitreous table is fissured and sometimes depressed. One of the most perfect of these specimens (No. 1,568, A. M. M.) is figured in No. 94, Photographic Series, S. G. O. An abstract of the case is subjoined:—

"Private David P——, Co. C, 35th Wisconsin Vols., was wounded at

Tupelo, Mississippi, July 18th, 1864, by a musket ball, which struck the skull obliquely, and apparently inflicted a scalp wound merely, between the sagittal suture, and the left parietal protuberance. There were no signs of cerebral disturbance. The wound was dressed simply, and the patient was conveyed to Memphis, Tennessee, and admitted into the Adams U.S. General Hospital on July 23rd. He was then perfectly rational, and free from head symptoms. Two days subsequently, indications of compression of the brain were observed, and on the afternoon of the 25th they had rapidly become aggravated. The pulse was slow, the respiration laboured, the pupils dilated, the sphincters relaxed. A very careful exploration of the wound was made, but, of course, no cranial fracture could be detected. The treatment was limited to cold applications to the head, scarified cups to the nucha, and brisk purging. On the 26th, the patient gradually became comatose. The discharges from the bowels and bladder were involuntary. The patient continued to sink on the 27th, and died at 1 a.m. on the 28th of July. At the autopsy the internal table of the left parietal was found to be fractured and depressed at a point corresponding with the wound in the scalp. The dura mater was wounded, and there was a large abscess in the left cerebral hemisphere.

"In a specimen which is believed to be unique, without any apparent lesion of the external table, a fragment of the vitreous plate of the frontal bone was found to be completely detached and depressed upon the dura mater."—Pp. 10-11.

"Specimens 3,639, 3,406, 622, 1,922, and 646, A. M. M., afford other examples of this rare form of injury, to which S. Cooper, Guthrie, Hennen, Hewitt, Williamson, and Legouest allude, illustrating their observations by a case examined by Mr. Dean, of Cambridgeshire, a specimen in the Dupuytren Museum, which is figured in M. Legouest's work, and specimen No. 2,893 of the Netley Collection.

"It is believed that this accident results, in most instances, from a small projectile striking the cranium very obliquely, or possibly, in some cases, from a comparatively slight blow from a body with a large plane surface."—Pp. 11-12.

"Several cases of undepressed fracture are reported in which a ball gouged out a small portion of the external table. A number of instances are recorded in which considerable portions of the calvaria have been removed by explosions of shell, without depression. Very rarely a musket-ball produces the same effect as in the following remarkable case. The patient is represented in Photograph No. 58, A. M. M.:—

"Private Edson D. Bemis, Co. K., 12th Massachusetts Vols., was wounded at Antietam by a musket-ball, which fractured the shaft of his left humerus. The fracture united kindly, with very slight angular displacement, and quarter of an inch shortening. Promoted to be cor-

poral, Bemis received, May 6th, 1864, at the battle of the Wilderness, a wound from a musket-ball in the right iliac fossa. He was treated in the Chelsea Hospital, near Philadelphia. There was extensive sloughing about the wound, but it ultimately healed entirely, leaving a large cicatrix, parallel with Poupart's ligament. Eight months after the injury, Bemis returned to duty with his regiment. On February 5th, 1865, Corporal Bemis was severely wounded at the engagement at Hatcher's Run, near Petersburgh, Virginia. Surgeon A. Vanderveer, 66th New York Vols., reports that the ball entered a little outside of the left frontal protuberance, and passing backwards and upwards, removed a piece of the squamous portion of the temporal bone, with brain substance and membranes. When the patient entered the hospital of the 1st Division of the 2nd Corps, brain matter was oozing from the wound. Respiration was slow; the pulse 40; the right side paralysed; insensibility total. On February 8th, the ball was removed from the substance of the left hemisphere. In a few days paralysis disappeared. The patient was transferred to Fort Richmond, New York Harbour. He recovered perfectly, and on July 15th visited Washington, and was photographed at the Army Medical Museum. The wound in the head was then nearly healed. There was a slight discharge of healthy pus from one point. The pulsation of the brain could be felt through the integument. The mental and sensory faculties were unimpaired. The corporal had been discharged from service, and recommended for a pension."—P. 13.

"Instances were not uncommon of the splitting of round musket-balls in striking the skull at an acute angle."—P. 14.

"Conoidal balls were less liable to split after this fashion, yet such instances were occasionally observed."—P. 14.

"The occurrence of hernia or fungus cerebri is mentioned in connexion with eighteen cases of gunshot fracture of the skull, complicated by lacerations of the dura mater and brain. In four of these cases recovery took place without operative interference with the protruding fungus mass, which, in these instances, gradually contracted, was then covered by granulations, and finally cicatrized. In those cases in which bandaging or compression were resorted to, cerebral oppression was soon manifested, and stupor and coma eventually supervened. In those in which the tumour was sliced off, as usually recommended, at the proper level of the brain, it was commonly speedily reproduced, and death from irritation ensued."—P. 17.

"In looking over the registers of gunshot injuries of the head two general facts are noticed: First, that in the after treatment of scalp wounds, a multitude of surgeons did not consider spare diet, perfect rest, and antiphlogistic measures as of essential importance; and, secondly, that in the treatment of cranial fractures, the general tendency was to the practice recommended by Guthrie in regard to operative procedures,

rather than the more expectant plan insisted upon by the majority of modern European writers on military surgery. The interest of the material and the importance of the subject alike invite extended comment; but in this brief and cursory review, the motto of Montaigne, *je raconte je ne juge pas*, must be rigorously adhered to."—P. 17.

"Of 187 recorded cases of gunshot fracture of the vertebræ, all but 7 proved fatal. Six of these were fractures of the transverse or spinous apophyses. The seventh case is that of a soldier wounded at Chickamauga, September 20th, 1863, by a musket-ball, which fractured the spinous process of the fourth lumbar vertebra, and penetrated to the vertebral canal. The ball and fragments of bone were extracted at a Nashville Hospital. The patient was transferred to Louisville, thence to Jefferson Barracks, Missouri, thence to Madison, Indiana, and finally, on July 26th, 1864, to Quincy, Illinois. The last report states that he was likely to recover. . . . . .

"Five thousand one hundred and ninety-five gunshot flesh wounds of the back have been recorded, of which a large proportion are injuries from shell. Troops being often ordered to lie down under a shell fire, this region becomes particularly exposed."—P. 21.

"In the treatment of penetrating wounds of the chest, venesection appears to have been abandoned altogether. Hæmorrhage was treated by the application of cold, perfect rest, and the administration of opium. These measures seem to have proved adequate generally, and no instances are reported of the performance of paracentesis or of the enlargement of wounds for the evacuation of effused blood. Hæmorrhage from the vessels of the costal parietes has been exceedingly rare, and, in the few instances recorded, was a secondary accident. Hence the management of bleeding from wounded intercostal arteries has presented theoretical rather than practical difficulties."—P. 21.

"The records of the results of the so-called method of 'hermetically sealing' gunshot penetrating wounds of the chest are sufficiently ample to warrant an unqualified condemnation of the practice. The histories of the cases in which this plan was adopted have been traced, in most instances, to their rapidly fatal conclusion."—P. 22.

"Few examples of recovery are recorded where the track of the ball passed near the root of the lung. The cases in which there was a fracture of the rib at the wound of entry were very dangerous. The established opinion, that penetrating wounds with lodgment of the ball are more fatal than perforating wounds, was amply illustrated. But few recoveries with balls lodged in the lung are recorded, and the histories of such cases are less explicit and complete than could be desired."—P. 22.

"Only four cases are recorded of gunshot wounds of the heart that came under treatment. The specimens from these four cases are pre-

served in the Army Medical Museum. The patient that lived longest after a gunshot wound of the heart survived twelve hours (Spec. 837, A.M.M.). In this case a small pistol-shot entered the left ventricle and passed out through the right auricle."—P. 23.

"*Gunshot Wounds of the Abdomen.*—Of 2,707 gunshot wounds of the abdomen reported from the beginning of the war, to July 1st, 1864, there were 2,164 flesh wounds, and 543 cases in which the peritoneal cavity was penetrated or the abdominal viscera injured. Among the flesh wounds, 114 fatal cases are recorded, which were, in most instances, cases of sloughing from injuries of the abdominal parietes by shells. Of the 543 penetrating wounds, the results have been ascertained in 414, and were fatal in 308, or 74 per cent. The number of recoveries is unexpectedly large, but includes only cases in which the reports showed, beyond question, that the abdominal cavity had been involved. . . .

"In many instances fæcal fistulæ were produced. They commonly closed after a time, without operative interference, reopening at intervals, and then healing permanently. . . . .

"Lieutenant G. P. Deichler, Co. I., 69th Pennsylvania Vols., aged twenty-two years, was wounded by a conoidal musket-ball, at Hatcher's Run, Virginia, in March, 1865. The ball entered the right iliac region, and, passing through the ascending colon, made its exit a little to the left of the last dorsal vertebra. The patient was taken to a field hospital, and from thence to Armory-square Hospital, at Washington, where he was admitted on April 1st, in an exhausted condition, with grave symptoms of peritonitis. There was a copious fæcal discharge from both wounds. Appropriate dressings were applied, a fourth of a grain of morphia was ordered to be given every second hour, and stimulants were directed. On April 7th, sloughs separated from both wounds, and left a clean granulating surface. A large piece of sphacelated omentum was removed from the anterior wound. The opiate treatment was continued till April 27th, when there was a fæcal evacuation by the anus, for the first time since the injury. On June 12th, the discharge from the wounds was very slight. The edges of the wounds were now refreshed and approximated by adhesive strips. On August 10th, the anterior wound was firmly healed. There was a small fistulous sinus at the posterior wound, discharging pus scantily. On this day, a photograph was taken at the Army Medical Museum, from which the plate opposite is copied, and the patient left the hospital for his home in excellent general health. . . . .

"Recoveries after wounds of the large intestines have been much more numerous than after wounds of the ileum or jejunum.

"No case has been reported in which it was thought expedient to apply a suture to the intestines after gunshot wounds.

"Gunshot wounds of the liver were usually followed by extravasation

into the abdominal cavity, and rapidly fatal peritonitis. Of 32 cases in which the diagnosis was unquestionable, all but 4 terminated fatally."—Pp. 25-26.

"All the cases of gunshot wounds of the spleen that have been reported were fatal. No symptoms are mentioned that particularly distinguished these from other gunshot injuries involving the abdominal cavity, and it is quite possible that the list of recoveries may include cases in which this viscus was injured, though the diagnosis was not made out.

"A case is recorded of a lacerated wound of the abdominal walls, with lesion and protrusion of the pancreas, a portion of which is reported to have been excised. It appears probable that it was rather a portion of the omentum that was removed. Several cases are reported in which it was believed that recovery took place after gunshot wounds of the kidney. But it can hardly be considered that the evidence of gunshot wound of the kidney was, in these places, unequivocal.

"Gunshot wounds of the bladder, when the projectile entered above the pubes or through the pelvic bones, have proved fatal, so far as the records have been examined. There are many examples of recovery, however, from injuries of the parts of the bladder uncovered by the peritoneum.

"Several examples of recovery, after protrusions of the abdominal viscera through gunshot wounds, have been reported. In two cases in which loops of small intestine issued, they were immediately returned and retained by means of adhesive strips and bandages, and the patients recovered with ventral hernia. The escape of omentum, through wounds, would not appear to be a very serious complication, for in many cases portions of protruding omentum have been excised, and the patients have, nevertheless, recovered promptly.

"Penetrating wounds of the abdomen, complicated with fractures of the vertebræ, uniformly proved fatal."—P. 27.

"*Gunshot Fractures of the Pelvis.*—The records under this head include only the cases in which the abdominal cavity was not penetrated. From the beginning of the war to October 1st, 1864, 359 such cases have been reported. Recovery took place in 97, death in 77, and the result is still to be ascertained in 185. In 256 cases the ilium alone was injured, the ischium alone in 19, the pubes in 12, the sacrum in 32, and in 40 cases the lesions extended to two or more portions of the innominata.

"The gravity of these cases depended upon the location and extent of the fracture. The majority of recoveries were from fracture of the ilium by musket-balls, in which the crest was grooved, or comparatively slight injury was inflicted. Yet there were many examples of perforation of the ilium with ultimate recovery. . . . .

"In most cases of injury to the pelvic bones, very tedious suppuration ensued, and surgery could do but little, except to facilitate the escape of pus, and to remove dead bone as it became separated. The returns

corroborate the observation of Stromeyer, that there is a great liability to pyæmia in gunshot fractures of the pelvis."—P. 28.

"*Gunshot Wounds of the Genito-Urinary Organs.*—In this category are included gunshot wounds of the genitals or urinary organs that are not complicated with fractures of the pelvis, or with penetration of the abdominal cavity. To October 1st, 1864, the reports furnish 457 such wounds, of which 37 had a fatal result.

"Surgeon S. W. Gross, U.S. Vols., reports the singular history of a soldier of the 16th U.S. Infantry, struck at Shiloh, on the right side of the penis by a conoidal musket-ball, which buried itself in the corpus cavernosum, and became encysted. It gave no pain, and the patient refused to have it extracted.

"The following is an interesting case of gunshot wound of the bladder:—

"Private Conrad L——, Co. A., 23rd Indiana Vols., aged thirty-two years, was wounded at Vicksburg, Miss., June 23rd, 1863, by a fragment of a hand-grenade, which entered the right nates two inches outside the end of the coccyx, and passed into the bladder where it lodged. Urine passed by the wound immediately after its reception. The patient was admitted into the General Hospital at Jefferson Barracks, Missouri, August 5th, 1863. His general health was much impaired. The urine passed mainly by the wound, and was largely mixed with pus and blood. The treatment directed comprised warm fomentations, mild diuretics, stimulants, and nutritious diet. On February 20th, 1864, a catheter was with much difficulty passed by the urethra, and the presence of a foreign body was ascertained. On March 19th, the general condition was improved, the wound was so far closed as to admit only a large-sized probe. Attempts to pass a catheter or to probe the wound caused chills and febrile irritation. On April 2nd, 1864, the lateral operation of lithotomy was performed by Surgeon John F. Randolph, U.S.A., the patient being anæsthetised by equal parts by bulk of chloroform and ether. A rectangular fragment of shell, largely incrusted with earthy phosphates, was extracted. It was two inches in length, seven-eighths of an inch in width, and three-eighths of an inch in thickness. It weighed two ounces and five grains troy. On April 12th, the urine passed by the wound. On April 27th the wound had healed, and the patient was soon afterwards restored to his ordinary condition of health. The incrusted fragment of shell is preserved in the collection of the Army Medical Museum (Spec. 88). It weighs 898 grains, portions of the phosphatic deposit having crumbled away."—P. 29.

As regards gunshot wounds of the upper and lower extremities, it has been deemed premature to make deductions from statistics which are daily augmenting and tending towards completion.

Many cases are as yet incomplete, either from imperfect records, or because their termination for good or evil has not yet arrived.

The following table is valuable, so far as it professes to go:—

"*Table exhibiting the Results of* 2,003 *Terminated Cases of Gunshot Fracture of the Femur, or of Gunshot Wounds of the Knee-Joint, out of* 3,106 *Cases that have been entered on the Records.*

	Total terminated	Amputation				Excision				Conservative Measures				Aggregate
		Recovered	Died	Undetermined	Mortality rate of determined cases	Recovered	Died	Undetermined	Mortality rate of determined cases	Recovered	Died	Undetermined	Mortality rate of determined cases	
Gunshot Fractures of Femur, implicating Hip-Joint..	82	0	2	0	100·	2	10	1	83·33	0	68	14	100·	97
Gunshot Fractures of upper third of Femur	387	8	24	11	75·	7	18	6	72·	93	237	199	71·81	603
Gunshot Fractures of middle third of Femur.....	346	42	51	47	54·83	2	13	10	86·66	106	132	148	55·46	551
Gunshot Fractures of lower third of Femur.....	418	131	112	117	46·09	1	1	0	50·	72	101	137	58·38	672
Gunshot Wounds of the Knee-Joint, with or without Fracture,.....	770	121	331	266	73·23	1	9	1	90·	50	258	146	83·76	1,183
	2,003	302	520	441	63·26	13	51	18	79·68	321	796	644	71·26	3,106

"In examining the above table in detail, it is seen that the results are ascertained in 822 of the 1,263 cases treated by amputation, or 65 per cent.; in 64 of the 82 cases treated by excision, or 78 per cent.; and in 1,117 of the 1,761 cases treated by conservative measures, or 63 per cent.

"The only recorded recoveries after gunshot fracture of the femur involving the hip-joint, are those in which excision was practised. In fractures of the upper third, the mortality rate is greatest for the cases treated by amputation. There were 43 of these cases, and in 19 of them the amputation was done at the hip-joint. Excision gives 7 recoveries after fractures of the upper third; two of these were excisions of the head and a portion of the shaft of the femur, 4 were formal excisions of the continuity, and 1 was a removal of fragments and rounding off of sharp edges of bone, which was admitted among the excisions with some hesitation. Under conservative measures 93 cases of fracture of the upper third had survived the injury a year or more, and are reported as recovered. The mortality rate of the completed cases of amputation for gunshot wounds of the knee-joint is large, and will probably be modified when the results of the numerous unfinished

cases are recorded. It depends partly, however, upon the excessive mortality of intermediate amputations of knee-joint injuries. With six or eight exceptions, the 50 recoveries without amputation classified with gunshot wounds of the knee-joint were examples of fractures of the patella, in which the evidence that the joint was opened was not unequivocal.

"Comparing in gross the 822 finished cases treated by amputation, with the 1,117 treated by conservation, the mortality rate of the former has the advantage by 8 per cent.; an advantage that is maintained in the different regions, except in the upper third. It must be remembered that the amputations include most of the bad cases, and those in which preservation of the limb was attempted and abandoned. . . . .

"In Stromeyer's classification of the action of bullets on bone, the fifth division is that in which the ball pierces the bone and forms a canal without causing further splintering. Examples are common in the upper portion of the tibia, but very rare in the upper extremity of the femur. The following is such an instance:—

"Captain James M. L——, Co. I., 20th Indiana Vols., was admitted into Columbia College Hospital, at Washington, June 29th, 1862, with two gunshot wounds, received a day or two previously in one of the battles before Richmond. The first wound was through the left lumbar muscles. After receiving it the officer fell, and while lying on the field he was again struck by an elongated musket-ball, which entered on the outer side of the left thigh, a little below the great trochanters, and passing upwards and inwards, lodged. A finger could be readily passed into the perforation in the femur, but the ball could not be reached. Three formal attempts to ascertain its position and accomplish its removal were made unsuccessfully. The patient died from exhaustion on August 19th, 1862. The near proximity of the ball had not induced any disease of the hip-joint. The specimen and the facts relating to it were contributed by Assistant-Surgeon W. M. Notson, U.S.A. . . .

"Just above the condyles, where the cancellated structure of bone predominates, musket-balls often make a clean perforation. But the wedge-like action of the elongated musket-ball almost invariably involves longitudinal splintering. . . . .

"The later writers on military surgery have duly insisted upon the different effect upon bones of the impact of round musket-balls and of the cylindro-conical projectiles. The degree of difference in the injuries inflicted has, perhaps, been exaggerated. It is unquestionably true, however, that the round ball usually produces much less longitudinal splintering than the conoidal ball, with its greater weight and immense force of propulsion and wedge-like action. . . . .

"One curious effect, occasionally produced by the heavy conoidal ball in striking the femur has not been very generally noticed. The bone is fissured and comminuted, though less than is common at the point at

which the ball impinges, while at two or three inches above or below this point, according as the point of impact is below or above the middle of the shaft, a nearly transverse fracture of the shaft is produced. The accompanying figure is an example; but the Museum contains a dozen better illustrations. The best are of cases in which a ball has struck the condyles anteriorly, and the shaft is snapped across two inches above. In several of these specimens, the transverse fracture is not connected by fissures with the comminuted fracture produced by the ball. It appears that these injuries were produced by balls fired at short range.

"When the femur is simply contused by a ball, a limited necrosis commonly ensues from the destruction of the periosteum, and inflammation of the medullary cavity often results, and death from pyæmic infection. The records would indicate that gunshot contusions of the long bones, a subject ably discussed of late by Surgeon J. A. Liddell, U.S. Vols., are more dangerous accidents than comminuted gunshot fractures even. Of gunshot contusions of the femur there are seventeen specimens at the Army Medical Museum. Several of these bones were sawn through the long axis, immediately after the death of the patient, and coloured drawings were prepared, exhibiting the appearances of the inflamed or suppurating or gangrenous medulla.

"Cases in which a portion of the shaft of the femur is gouged out, or a part of its cylinder crushed without entire division of the continuity, are also very fatal."—Pp. 31-2-3-4.

"Of gunshot injuries of the knee-joint, the Museum possesses 355 specimens." . . . .

"Dr. Bellanger has recorded five fatal cases of gunshot injuries of the knee-joint treated by free incisions into the articulation, and Surgeon Liddell, U.S. Vols., has published three such cases. The records contain a score of similar examples. Yet amputations for gunshot injuries of the knee that have reached the secondary period are scarcely less disastrous."—P. 36.

"*Gunshot Wounds of the Arteries.*—The number of cases reported under this head is extremely small. . . . . Those only are included in which the canal of a large vessel is primarily opened, and in which this is the principal accident. Such cases are to be sought for among the dead on the battle-field rather than in the field hospitals. . . . . In the few cases of primary gunshot lesions of the arteries that came under treatment, it was usually found that only a portion of the calibre of the vessel had been carried away, and that retraction had been thus prevented. But 44 cases are entered on the records. In most of them ligatures were placed above and below the seat of injury; but, in a few instances, the main trunk was tied at a distance, and amputation was practised when the bleeding recurred. Twenty of the 44 cases terminated fatally."—Pp. 38-9.

No special reports on wounds of veins seem to have been received.

Wounds of nerves are dealt with in a special report, which we shall notice farther on.

The number of sabre and bayonet wounds which came under treatment did not amount to 250, and present no special interest.

"*Tetanus.*—The 363 cases of traumatic tetanus recorded in the register for that subject are all that have been reported during the war. The proportion to the total number of wounds is not large. In the Schleswick Holstein war, Stromeyer had 6 cases among 2,000 wounded. In Napoleon's campaign in Egypt, in the Peninsular campaign, and in the revolt in India, the ratio appears to have been larger than this. Among 12,094 wounded, the British in the Crimea had 19 cases only.

"The histories of the 363 reported cases of tetanus are generally satisfactory in their details of symptoms, progress, and treatment: 336 cases terminated fatally. Of the 27 recoveries reported, the disease was of a chronic form in 23. In the 4 remaining cases the symptoms were very grave. In 2, recovery took place under the use of opiates and stimulants; in 2, after amputation of the wounded part.

"The great majority of the cases were treated by the free use of opium, combined with stimulants and concentrated nourishment. Chloroform inhalations were very generally employed during the paroxysms of spasmodic contraction. Subcutaneous injections of the salts of morphia and atropia were frequently used. Cathartics, quinia, camphor, cannabis indica, bromide of potassium, strychnia, belladonna, and aconite are mentioned among the remedies employed. Cups, blisters, turpentine stupes, and ice, were among the applications made to the spine; and fomentations with opium or tobacco were, in some cases, applied to the wound. Amputation, the division of nerves, and the extirpation of neuromata in stumps were the surgical measures sometimes employed. The results have not modified the conclusion of Romberg, that 'wherever tetanus puts on the acute form, no curative proceeding will avail, while in the milder and more tardy form the most various remedies have been followed by cure.' The value of nicotine, of the Calabar bean, and of curare as curative agents in tetanus was not tested.

"Autopsies were made in many cases, but with almost negative results."—Pp. 41-42.

"*Secondary Hæmorrhage.*—In reviewing the 650 recorded cases of secondary hemorrhage from gunshot wounds, it appears that, during the earlier part of the war, there were many surgeons who were not sufficiently impressed by the precepts of Bell and Guthrie, and who frequently treated secondary hæmorrhage from gunshot wounds by tying the main trunk at a distance from the wound, even when the bleeding occurred at a comparatively early period. Later in the war, however, it was the universal practice to endeavour to secure both ends of the

bleeding vessel at the seat of injury, and some brilliant examples are recorded in which this was accomplished in wounds of the posterior tibial or popliteal, when limbs had become infiltrated and swollen, and the difficulties of the operations were immense."—P. 43.

"*Pyæmia.*—On this subject 281 reports have been examined, and the individual cases detailed in them have been transcribed upon the registers: 251 special reports on the subject remain to be examined. The histories of 754 cases are recorded in the register, the *post mortem* observations accompanying a large proportion of the fatal cases. These number 719, or 95·35 per cent. Pyæmia supervened in 377 cases of gunshot injury in which no operation had been performed, and after 295 cases of amputation, of which 155 were cases of amputation in the continuity of the femur. The purulent infection was subsequent to excision of the shafts of long bones in 27 cases, and to excisions of joints in 28 cases."

"These figures by no means represent the frequency with which pyæmic poisoning has occurred. It has been one of the great sources of mortality after amputations, and its victims are to be counted by thousands. The small number of cases on the register are taken from special reports. Several valuable papers have been contributed on the pathology of this affection, and a number of statistical reports on its treatment. The conclusions of the latter are adverse to the therapeutical utility of the sulphites and hyposulphites in this disease."—P. 43-4.

"*Amputations.*—The histories of 13,397 amputations for gunshot injury have been examined and recorded, and the final results have been ascertained in 9,705 cases. The following table exhibits the number belonging to each region, and includes both primary and secondary cases. It shows the regular increase in the rate of mortality as the the trunk is approached.

Amputations of the Superior Extremities.	Recovered	Died	Total	Per cent. of Mortality
Fingers and Parts of the Hand ...	1,778	29	1,807	1·60
Wrist	34	2	36	5·55
Elbow	19	0	19	
Forearm	500	99	599	16·52
Arm	1,535	414	1,949	21·24
Shoulder-Joint	144	93	237	39·24
Total of Upper Extremity ...	4,010	637	4,647	13·70
Amputations of the Inferior Extremities.				
Toes	784	6	790	·75
Partial Amputations of the Foot ...	108	11	119	9·24
Ankle-Joint	58	9	67	13·43
Leg	1,737	611	2,348	26·02
Knee-Joint	52	64	116	55.17
Thigh	568	1,029	1,597	64·43
Hip-Joint	3	18	21	85·71
Total of Lower Extremity ...	3,310	1,748	5,058	34·55
Aggregate	7,320	2,385	9,705	24·57

"*Amputations at the Wrist.*—The disarticulation at the wrist has been performed in preference to the amputation of the forearm, when the hand was totally disorganized. When practised by the circular method it is a good operation. The results of the cases examined are satisfactory, themortality being ten per cent. less than in amputation of the forearm."—P. 45.

"*Amputations at the Elbow.*—The returns corroborate the conclusions of Dupuytren, Malgaigne, and Legouest, who combat the disfavour into which this operation has fallen. It was done infrequently in the late war, but 19 cases having been reported. But in all of these the ultimate results have been ascertained, and were favourable in every instance. The success of Salleron and other French surgeons with this operation in the Crimea is well known. Whenever, then, it is impracticable to amputate the forearm, disarticulation at the elbow should be preferred to amputation of the arm. The oval method answers the purpose best in this locality."—P. 46.

"*Amputations at the Ankle-Joint.*—The record is far from complete. In the terminated cases, Syme's method was employed in 25 cases, Roux's method in 2 cases, and Pirogoff's in 9 cases. Several casts and photographs of well-rounded stumps, obtained by the latter procedure, are deposited in the Army Medical Museum. But the operation appears to be regarded with little favour. Baron von Horronitz, Surgeon-in-Chief of the Russian Marine, in his recent visit to this office, mentioned that Pirogoff had himself abandoned it, finding the segment of the os calcis likely to become necrosed."—P. 46.

"Of 49 cases of primary amputation at the knee-joint, 31 recovered and 16 died; while 2 underwent re-amputation, of whom 1 recovered, and 1, a tuberculous subject, died. This gives a percentage of mortality in primary amputations at the knee-joint of 34·9. The mortality in primary amputation at the lower third of the thigh is much larger than this; indeed it has been already indisputably proved by the Crimean statistics, and by M. Malgaigne, that the mortality in amputation augments in exact proportion as the incisions approach the trunk. . .

"The objection to amputations at the knee-joint, that the resulting stump is ill adapted to the use of an artificial limb, is set at rest by the results obtained by Hudson and other manufacturers, who distinctly declare that the stumps from the operation at the knee-joint give a base of support far better than any possibly to be gained in thigh-stumps."—Pp. 47-8.

"*Amputations of the Thigh.*—In 1,597 terminated cases, 568 recovered and 1,029 died, or 64·43 per cent., which is within a fraction of the mortality after amputations of the thigh in the English army in the Crimea, during the latter part of the campaign. In the French army in the Crimea, the whole number of amputations of the thigh for gunshot injuries was 1,666, of which 1,513, or 91·89 per cent. terminated fatally.

"Of these 1,597 amputations, the date of operation is ascertained

with precision in 1,061. Of these, 423 were primary and 638 were intermediate or secondary. The ratio of mortality was 54·13 in the former, and 74·76 in the latter."—P. 48.

Amputation at the hip-joint constitutes the subject of Circular No. 7, and shall also receive a special notice.

"*Excisions of the Wrist.*—The 35 cases included in this category were all examples of partial excision. In 27, the ends of the radius or ulna, or of both, were removed, and, in some instances, shattered fragments of the upper row of carpal bones. In 8, the greater part of the carpus was excised. Death took place once from pyæma, and twice from exhaustion from protracted suppuration and irritative fever; 26 cases are reported as recovered. In two cases, amputation of the forearm became necessary. The reports are unsatisfactory in relation to the amount of mobility left in the hand, and the cases are now under investigation with reference to this point."—P. 54.

"*Excisions of the Elbow.*—The returns for three-fourths of the entire period give 315 cases of excision of the elbow, and the results are ascertained in 286 cases. In 16 cases amputation of the arm became necessary; 62 cases terminated fatally, or 21·67 per cent., which is a mortality a fraction greater than that resulting from amputations of the arm. This result is altogether opposed to the Schleswick Holstein and Crimean experience, and will doubtless be modified when the statistics are completed. It may be ascribed partly to the fact that the returns for the earlier part of the war include quite a large proportion of partial excisions, which are far more hazardous than complete removal of the articular surfaces."—P. 55.

"*Excisions of the Shoulder-Joint.*—Nearly all the cases that have been reported during the war have been recorded. The results are given in the following table:—

Table exhibiting the Results of Cases of Excisions of the Shoulder-Joint for Gunshot Injuries.

	Primary Operations	Secondary Operations
Died	50	115
Recovered	160	183
Results undetermined	42	25
	252	323
Aggregate	575	

"The percentage of mortality is 23·8 in primary cases, 38·59 in secondary cases, or a mean ratio of 32·48. The ratio in amputations at the shoulder-joint is 39·24, a percentage of 6·76 in favour of excision. Of 36 cases of gunshot fracture of the head of the humerus, selected as favourable cases for the expectant plan and treated without excision or amputation, 16 died, or 44·4 per cent., a ratio in favour of excision of 11·96 per cent. But it is superfluous to offer further proofs in behalf of this admirable operation."—P. 55.

"Where the shaft of the humerus has been extensively shattered, our surgeons have not been deterred by the prohibition of Guthrie, but have frequently removed the head within even five and six inches of the diaphysis, with excellent results."—P. 56.

"In the remarkable case of Private Cleghorn, 1st New Jersey Cavalry, after an excision of the head and upper third of humerus, the remainder of the bone became necrosed, and was excised, together with the articular ends of the radius and ulna, and yet a limb was preserved which, with the aid of ingenious apparatus, is very useful. (Photograph 112, A.M.M.)—P. 57.

"It appears, then, that the judicious use of the gouge and bone forceps is admissible in gunshot wounds of the ankle-joint; but that the formal excisions are rarely successful."—P. 57.

"*Excisions of the Knee-Joint.*—Prior to the present war, there were but seven recorded examples of excision of the knee for gunshot injury. These were, the elder Textor's case (in 1847); the Schleswick Holstein case (1851), in which Fahle operated by Stromeyer's direction; Mr. Lakin's case (1855), in the Crimea; the Alumbaugh case (1857), in the Indian Mutiny; the case of a man in the London Hospitals wounded by bird shot (1861); a similar case at Birmingham (1861); and lastly, Verneuil's case.

"Verneuil's case and the Birmingham case were successful. The patients were lads of seventeen and nineteen. . . . .

"During the late war, complete excision of the knee-joint has been performed eleven times, with two successes."—P. 57.

"*Excisions of the Head of the Femur.*—There were then on record, previous to the late war, twelve cases of this operation, with one success. This was the case reported by Surgeon O'Leary of the 68th British Infantry, who excised the head and several inches of the shaft of the femur for Private Thomas Mackenena, the great trochanter being shattered by a fragment of shell.

"Experience having demonstrated the uniform fatality of gunshot fractures of the head or neck of the femur when abandoned to the resources of nature, and the excessive mortality of amputations at the hip-joint for gunshot injury, the highest authorities in military surgery were then unanimous in advising, under suitable conditions, excision of

the head of the femur, until, as Baron Hippolyte Larrey expressed it, the experiments of the future proved more discouraging than the experience of the past."—P. 61.

Of thirty-two cases in the late war twenty-eight died, and only four recovered.

"*Ligations.*—The following table exhibits the number of cases of ligation of the larger arteries, from the beginning of the war to March, 1864:—

	Number of cases recovered	Number of cases died	Total	Ratio of Mortality
Common Carotid	12	37	49	75·51
External Carotid	...	2	2	100·
Subclavian, otherwise Scalenus	7	28	35	80·
Axillary	3	21	24	87·50
Brachial	53	11	64	17·18
Radial	12	2	14	14·28
Ulnar	9	2	11	18·18
Common Iliac	...	3	3	100·
Internal Iliac	...	2	2	100·
External Iliac	2	14	16	87·50
Femoral	25	83	108	76·85
Profunda	1	6	7	85·71
Popliteal	4	12	16	75·
Anterior Tibial	11	5	16	31·25
Posterior Tibial	13	6	19	31·57
Peroneal	...	2	2	100·
All others	11	4	15	26·66
Aggregate ...	163	240	403	...

"Of the three cases of ligation of the common iliac, one was performed by Surgeon M'Kee, U.S.A., on account of secondary hæmorrhage from a branch of the left internal iliac. The hæmorrhage resulted from a gunshot wound of the pelvis, and occurred on the 15th and again on the twenty-third day. On the second bleeding, the internal iliac was tied; but the hæmorrhage was not controlled, and the main trunk was secured. The patient survived two days, and the bleeding did not recur. . . .

"The new hæmostatic process recommended by Professor Simpson was adopted in a few cases, with favourable results."—Pp. 78-9.

"The register of operations for surgical diseases contains the histories of 443 cases, many of which were of great interest. For example, 15 cases of tracheotomy or laryngotomy are recorded, with six recoveries. The operation was done once, with success, in a case of croupal diphtheritis."—P. 79.

"*Anæsthetics.*—There have been consulted, in regard to the employment

of anæsthetics, the reports of 23,260 surgical operations performed on the field or in general hospitals. Chloroform was used in 60 per cent. of these operations, ether in 30 per cent., and in 10 per cent. of the cases a mixture of the two was administered. At the general hospitals, the greater safety of ether as an anæsthetic was commonly conceded. It was often employed, and no fatal accident from its use has been reported. In the field operations, chloroform was almost exclusively used. The returns indicate that it was administered in not less than eighty thousand cases. In seven instances, fatal results have been ascribed with apparent fairness to its use."—P. 87.

The medical portion of No. 6 contains numerous tables, showing the comparative frequency of the several diseases. Space forbids us to copy these, and extracts from them would be useless.

We must content ourselves with a few extracts on the more important diseases.

"*Camp Fever*—(*Typho-malarial Fever*).—On account of the great mortality resulting from it, camp fever has been, during the two years under consideration, the most important of the diseases of the army.

"Under the general designation of Camp Fever, all those cases are here included which were reported, during the first year of the war, under the heads of Typhus, Typhoid, Common Continued, and Remittent Fevers, and, during the second year, under the heads of Typhus, Typhoid, Typho-Malarial, and Remittent. . . . .

"Using then the term Camp Fever in the broad sense above indicated, the following statistical facts may be presented:

"The whole number of cases during the first year of the war was 74,619, the deaths 6,315; during the second year, 138,641 cases and 13,144 deaths,—the total for the two years being 213,260 cases and 19,459 deaths. . . . .

"The ratio of cases and deaths to strength is very similar for both years. In a general way, it may be said that each year about one-quarter of the men suffered from some form of the fever, and that the deaths amounted to about two per cent. of the strength. The whole number of deaths from fevers during the first year was nearly one-half the total mortality from disease: during the second year, owing to the increased mortality from other diseases, and especially from diarrhœa and dysentery, only about one-third the total mortality from disease, though still maintaining nearly the same ratio to strength.—Pp. 109-10.

"*Diarrhœa and Dysentery.*—Much interesting material has been collected bearing on the causes, symptoms, nature, and treatment of these formidable affections. . . . .

"The origin of the diarrhœa and dysentery of troops is to be sought

in no one condition, but in the co-operation of several, each of which should be the subject of hygienic precautions, if the health of an army is to be preserved. Some of the chief of these, but assuredly not the only ones, are the scorbutic taint dependent upon camp diet, the malarial influences operating in certain seasons and regions, the overcrowding and filth of camps and barracks, the heat of summer, the exhaustion and fatigue of campaigns, and the use of water containing saline or organic impurities. Whether there has ever existed, in addition to these intelligible conditions, any specific causative momentum deserving the designation of epidemic influence, is a grave question which receives no affirmative reply from any experience reported during this war. The causation of *chronic* diarrhœa and dysentery is to be found in the long-continued action of the influences above mentioned, and in the consequent frequency and duration of attacks, but not in any specific cause or set of causes different from those which induce the acute form."—P. 121.

"It is impossible to escape the conviction that a change of climate is one of the most important elements in the treatment of these diseases . . . and throughout the war, patients suffering from the fevers and bowel affections of southern latitudes were, as far as the exigencies of the service would permit, transferred to the North."—P. 122.

"Chronic flux, unaccompanied by camp fever, may run its course to its own natural termination in extreme emaciation, with death from debility and exhaustion; or, as perhaps happens more frequently, terminate at an earlier period, in consequence of the occurrence of some disastrous complication. Often, for example, after the disease has lasted a long time without fever, the stools varying from two or three to twenty or more daily, the patient still walking about and suffering little pain, acute dysenteric symptoms set in with fever, delirium, abdominal tenderness, tormina, tenesmus, rapid sinking, and death in a few days. An autopsy shows the colon, which is more or less ulcerated according to the previous duration and severity of the flux, to be coated with a yellowish or greenish-yellow, sometimes brownish-yellow, pseudo-membrane, which often extends also through the small intestines. The nature of this pseudo-membrane has been made the subject of careful investigation in the Museum, and the examination of a large number of cases leaves no doubt on the matter. It is simply the croupous lymph, pseudo-plastic lymph, caco-plastic lymph, or false membrane of medical writers. The examination by the microscope of properly prepared sections shows it to be composed of innumerable round cells (lymph cells, pus cells), held together by an adhesive granular matrix more or less resembling coagulated fibrin. With such sections, there is no difficulty in tracing the origin of this membrane to a rapid multiplication of the epithelial cells and superficial connective tissue corpuscles of the diseased mucous membrane. The condition thus described is not always fatal, tubular casts of false

membrane having been found in the stools of patients, with the above-described symptoms, who have subsequently recovered.

"Another grave complication is diphtheria, with the formation of a similar false membrane in the fauces and respiratory passages. The membrane does not differ from that formed in ordinary diphtheria in civil life. The Museum contains several fine specimens. I have made a careful examination of the false membrane in a number of cases of this sort. It is anatomically similar to the false membrane of the intestine, and its origin is as readily traced to the epithelium of the mucous membrane, the connective tissue of which is, however, less frequently involved in the cell multiplication. The early stage of the diphtheritic affection, in these cases, is often associated with œdema of the glottis, which sometimes suddenly proves fatal before the formation of the false membrane. It may be mentioned in this place, that œdema of the glottis, with or without the formation of a diphtheritic false membrane, has been a not unfrequent mode of death in cases of protracted suffering from gunshot wounds. Other fatal complications of common occurrence in chronic diarrhœa are pneumonia, congestion of the lungs, serous apoplexy, Bright's disease of the kidneys, &c., &c.

"An interesting complication which has several times been brought to my notice in autopsies is the formation of metastatic foci, generally in the liver, but sometimes also in the lungs and spleen. These foci precisely resemble those which occur in pyæmia after gunshot wounds. I have met them in the bodies of men dead of diarrhœa, who had received no wound or injury, but who had extensive ulceration of the colon. These are the only cases in which, with propriety, '*embolism*' can be spoken of as a complication of chronic diarrhœa. The heart clots (death polypi), observed in the autopsies of this disease, differ in no respect from those so frequently occurring in patients dead of the most diverse affections, and even, under certain circumstances, in animals killed by violence; and all the evidence which careful investigation has hitherto accumulated on the subject is in favour of the opinion that they are formed during the death agony—consequences and not causes of the fatal issue. Ordinary abscesses of the liver, sometimes of great size, were not very rare, and a number of illustrative specimens have been received at the Museum. . . . .

"The papers above referred to contain also much interesting detail as to the *treatment* of these affections, which cannot be here introduced on account of its bulk. A few remarks may, however, be made in reference to the chronic variety. In this form, the two most important elements of treatment would appear to be diet and climate. The diet should be antiscorbutic. Fresh meat and broth made from it, eggs, milk, oysters, &c., are of the greatest value; but fresh vegetables also exercise a favourable influence. If the disease remains obstinate under this diet

and suitable medication, the patient should be transported to a non-malarial northern locality. As to medication, the whole range of vegetable and mineral tonics, astringents and alteratives have been employed with variable success. Among the remedies which have been brought into extensive use in this country for the first time during the present war, I may briefly mention subnitrate of bismuth, strychnia, and arsenic.

"Subnitrate of bismuth is perhaps the most generally available of these articles. The first paper published on its use in camp diarrhœa was that of Acting Assistant Surgeon J. B. Trask, who recommended it in both the acute and chronic forms. Dr. Trask advised the bismuth to be given daily in one large dose of from one to four scruples, which he regarded as more efficacious than its use in divided doses. He was very sanguine as to its success in all cases in which the patient was not actually dying when the treatment was commenced. He says: 'In not a case of the two hundred and seventy treated at Finley Hospital during the period named, and by this agent, was there a failure in promptly and radically arresting the disease, when given in the quantities and time as stated.' In September, 1863, Surgeon T. Rush Spencer, U. S. Vols., made an official report on the use of the remedy in seventy-six cases, sixty of which were chronic and sixteen acute. Seventy-one of these cases were cured and five still under treatment at the date of his report. The treatment in the successful cases lasted from one to eight days. Influenced by these and other reports, I myself tried the remedy quite extensively, and was cognizant of its use in a large number of cases of both acute and chronic diarrhœa. It generally showed itself a most valuable agent. In a few cases, however, tormina, tenesmus, and other dysenteric phenomena, with an aggravation of all the symptoms, followed its use, and in a very considerable proportion of the severe chronic cases it appeared to be wholly without effect. The subsequent experience of many surgeons in the field and in hospital gave similar results; so that while it must be admitted to be a quite useful remedy, especially when given in large doses, the extravagant expectations which were at first entertained with regard to it by some must be abandoned.

"Strychnia was also extensively used by some surgeons. It was given in the form of sulphate, or as extract of nux vomica. Very generally it was combined with quinine, or with quinine and iron, and proved valuable in many atonic and paralytic conditions of the bowels, but was far from being of general availability in the treatment of severe chronic cases.

"Arsenic in pill, or in the form of Fowler's solution, was more frequently useful, and by some surgeons this remedy was regarded almost as a specific. So far as I have been able to learn, it was chiefly available in cases complicated with chronic and malarial poisoning. The utter failure of these, or indeed any therapeutic agents, to command general confidence, or to come into general use, will serve to show how subordinate

their effect is to be regarded to that of proper dietic and climatic conditions."—Pp. 123-4-5-6.

"*Certain other Diseases.*—The most important affections reported under the head of *Enthetic Diseases* were the several forms of venereal. The reports give separate figures for syphilis, gonorrhœa, orchitis, and stricture of the urethra. The latter two affections being gonorrhœal sequelæ, may be grouped under the head of gonorrhœa. Of syphilis, there were 9,011 cases and 12 deaths during the first year; 13,781 cases and 27 deaths during the second—total, 22,792 cases and 39 deaths. Of gonorrhœa and its sequelæ, 14,768 cases and no deaths during the first year; 25,705 cases and 12 deaths during the second—total 40,473 cases and 12 deaths. The number of cases of all kinds of venereal was 23,779 for the first year, and 39,486 for the second, being 85 cases per 1,000 of strength for the first year, and 66 per 1,000 for the second. The ratio of venereal to the total amount of disease was one case of venereal to every 35 taken sick during the first year; one to every 41 taken sick during the second.

"If these figures be compared with the experience of other armies, we cannot fail to congratulate ourselves on the comparative exemption of our troops from these loathsome affections. The published statistics of the English army, for example, show that in 1859 there were 442 admissions to hospital for venereal among every 1,000 men serving in the United Kingdom; in 1860, 369 per 1,000; in 1861, 354; and in 1862, 330—being thus between one-third and one-half the whole number of admissions to hospital. It may be thought, perhaps, that the active occupations of a war carried on in an extensive and comparatively thinly-populated country will account for this difference in our favour; but the published statistics of the United States army from 1840 to 1859 give a mean annual rate of only 99 cases of venereal per 1,000 of mean strength during that period; and this, though larger than the rates above given for the first two years of the war, is less than one-third of the most favourable rate above quoted from the English statistics.

"When the frequency of venereal among the troops of the three regions is made the subject of comparison, it is found that in the Atlantic region the rate was 87 cases per 1,000 of strength for the first year, 61 for the second; in the Central region 60 per 1,000 for the first year, 63 for the second; in the Pacific region, rates are, however, attained which closely approximate those of the English army, viz.: 375 per 1,000 for the first year and 317 for the second."—Pp. 132-3.

"The plan employed in the photographic work, hitherto executed with high powers, is as follows:—The direct rays of the sun, reflected in a constant direction from the mirror of a Silbermann's heliostat (loaned for the purpose by the Coast Survey), are condensed by a large lens upon the plane mirror of the microscope, whence they are reflected

through the achromatic condenser in the usual way. Before reaching the achromatic condenser, however, the rays pass through a cell containing a solution of the ammonio-sulphate of copper of sufficient density to absorb nearly all the rays except those at the violet end of the spectrum. The light used, therefore, is essentially monochromatic, and contains, with enough illumination for agreeable vision, the greater part of the actinic force of the sun's rays. The heating rays being chiefly at the other extremity of the spectrum are of course excluded, and great actinic force is obtained, therefore, without any danger to the preparations or the balsam cementing of the object glasses. The object-glass employed in the photograph of Gyrosigma above alluded to, was a one-eighth of an inch, by W. Wales and Co., of Fort Lee, New Jersey. This glass is so constructed as to bring the actinic rays to a focus. At the bottom of the draw-tube was placed an achromatic concave lens—the amplifier of Tolles (of Canastota, N. Y.), and an ordinary medium eye-piece completed the optical apparatus. The eye-piece extremity of the microscope was thrust into one end of a long camera box, the connexion made light-tight by means of a black silk hood, and the image, received on a piece of plate glass, observed by means of a focussing glass, while the focal adjustments were made. As with the very long camera used, the arm of the observer cannot reach the milled head of the fine adjustment of the microscope, this head was grooved and connected by a band with a grooved wheel at the end of a long steel rod, the other extremity of which is near the observer, who, by means of it, can focus accurately with any required length of camera. There is nothing peculiar in the chemicals employed, and, with ordinary collodion, and the high power above spoken of, from thirty to forty seconds' exposure was quite sufficient.

"Of the foregoing devices, most importance is to be attached to the employment of monochromatic light (the violet end of the spectrum), and the use of an object-glass constructed with special reference to the actinic rays. Both these points were suggested to me by Mr. L. W. Rutherford, of New York, so well known by his connexion with telescopic photography, who has thought much and made many satisfactory experiments in this direction. I believe, however, that the apparatus, as above described, loses some of its advantages by the use of the eye-piece, which I propose to substitute by a lens of proper magnifying power, corrected, like the object-glass in such a way as to bring to a focus the actinic rays. Such a lens is now in process of construction for further experiment."—Pp. 148-9.

Circular No. 7 is also by Brevet Lieut.-Colonel Otis. It is a report on amputation of the hip-joint in military surgery, and is divided into an historical summary, an account of individual cases, a citation of the opinions of surgeons, and a discussion of results.

The historical summary, though brief, is complete. First, suggested by Moraud, a French surgeon, who studied in England about the year 1729, then opposed and defended, upon theoretical grounds, by many of his compatriots, it remained for Larrey to establish it finally as a feasible and successful operation. Kerr, of Northampton, had certainly performed it twenty years before Larrey, but in a case which was utterly hopeless. Setting aside certain doubtful or unauthenticated cases, 108 amputations at the hip-joint had been performed for gunshot injuries or their consecutive lesions prior to the American War.

"The recoveries were but ten in number—one after a primary, four after intermediate, and five after secondary operations—a percentage of mortality of 91·65."

In civil practice the operation has been followed by a much larger mead of success, as might naturally be expected, seeing that the after care which is possible in military surgery must, as a rule, fall far short of what can be attained in civil practice.

"Of the 111 amputations at the hip-joint in civil practice here recorded, 46 succeeded and 65 ended fatally—a mortality rate of 58·56."

In the late war there have been fifty-three authenticated instances of this operation—thirty-four in the United States armies, and nineteen in the Confederates.

The subdivision adopted for these fifty-three cases may be open to criticism, but we give it as it stands:—

"The fifty-three authenticated operations now to be described are divided into four categories—primary, intermediate, and secondary amputations, and re-amputations. Practical surgeons are very generally agreed at the present day that amputations for injury should be classified in at least three categories, according to the period at which they are performed, and that the old division into primary and secondary operations is insufficient. Beyond question there are three distinct, successive, and easily appreciated periods in which amputations are performed—the period between the reception of the injury and the appearance of the inflammatory symptoms; when inflammatory action has commenced and is more or less capable of disturbing the animal economy; and when the violence of the inflammatory symptoms and symptomatic fever have abated and the suppurative stage is fully established. Operations done in either of these periods differ widely in their attendant circumstances and in their results. It is important, therefore, that they should be grouped in separate classes."

"I have placed in the class of *primary* amputations those performed in the interval between the reception of the injury and the commencement of inflammatory symptoms, and I believe that, in cases of gunshot injury, the duration of this period will very rarely be found to exceed twenty hours. I have selected the epithet *intermediate* for the operations of the second class as being more conformable to our idiom than *mediate* or *intermediary*, and I have included in this category those amputations performed during the persistence of the inflammatory stage, a variable period, usually included between the day after the reception of the injury and some time in the second or third month. The *secondary* amputations comprise those performed at a period when the inflammation had abated and the lesions had become, in a measure, local and analogous to chronic disease, excluding the cases in which amputation had been previously performed in the continuity. I have placed those cases in which an amputation in the continuity has preceded the amputation in the contiguity in a fourth category, and have designated such operations *re-amputations*. It appears to me impracticable, even were it desirable, to restrict the term secondary, which has been so long used in a more general sense, to these operations. And yet it is important that they should be separated into a distinct class, because they are quite numerous and widely differ in the risk attendant upon them from other secondary operations. The term *re-amputations*, if awkward, is not likely to be misunderstood."

"*Primary Amputations.*—In each of the nineteen cases included in this category, amputation was performed within twenty hours of the infliction of the injury. Several of the operations were immediate amputations in the strictest construction of that term. The average interval between the reception of the wound and the operation was seven hours. Eleven of the patients succumbed to the direct shock of the operation, surviving from a half hour to ten hours. Three lingered for two days, and two for eight or ten days. One has survived the operation over four years, and is now in excellent health. Two so far recovered that they were known to be in good condition, in one case two months, and in the other six months from the dates at which the operations were performed. It is to be hoped that the subsequent histories of these men may be traced, and that it may be proved that the operations had permanently successful results. At present, these cases cannot be regarded as recoveries authenticated beyond all question. Excluding these cases, the percentage of mortality in the primary amputations at the hip-joint was 94·73. Including them, the mortality rate is reduced to 84·21."

Criticising these nineteen cases, the author of the Circular gives his opinion, that in three instances the operation was of absolute urgency; in two it was rendered necessary by the necessities of

transporting the patient; in five, though almost hopeless, it mitigated the patients' sufferings; in one it was plainly unjustifiable, being perfectly hopeless; and—

"In regard to the eight remaining cases in which amputation was done for injuries to upper extremity of the femur by musket balls, notwithstanding the one or two successful results, surgeons will not fail to discuss whether an equal or greater saving of life might not have been attained by an expectant or temporizing plan. Dr. Gilmore, who operated in three of these cases, and subsequently twice excised the head of the femur, and also treated a comparatively large number of similar injuries by the conservative method, declares as the result of his unusually extended observation, that recovery ensues in a far larger proportion of gunshot injuries of the upper extremity of the femur left to the efforts of nature than in such injuries treated by primary amputation or excision."

"*Intermediate Amputations.*—The eighteen operations included in this category resulted fatally. They were all done, of course, during the inflammatory period, and without exception upon patients who from unavoidable neglect and exposure were ill-fitted to undergo operations."

The question of operation at the intermediate stage is settled practically in one line—the eighteen done at this period all ended fatally.

"*Secondary Amputations.*—Of the nine cases included in this series two recovered and seven died, a percentage of mortality of 77·78. Three patients sank from the shock of the operation. One with a shattered constitution, with phthisis and lithiasis, died seventeen weeks after the operation, his stump nearly healed. One had secondary hæmorrhage and phlebitis subsequently, and succumbed in twenty-three days. One died on the tenth day from the giving way of the femoral at the point of ligation. One died on the third day with surgical fever and erysipelatous inflammation of the stump. Excluding the case in which death resulted from profuse secondary hæmorrhage, those patients survived longest in whom the operation was longest deferred. The average period the patient survived the operation in the seven fatal cases was twenty-two days. The shortest interval between the injury and operation was forty-three days; the longest was two years, nine months and twenty-one days. The average interval in the nine cases was four hundred and twenty-nine days."

"*Re-amputations.*—This category comprises seven cases, with the low mortality rate of 42·85—four patients having recovered. Of the three fatal cases, one died from pyæmia, eight days after the operation, and two, worn out by protracted suffering, were unable to support

the shock of the operation, and sank in a few hours. In six of the cases the antecedent amputation was done on account of gunshot injuries; in one, for a bayonet stab of the knee. . . . In six of the cases the previous amputations were done at the lower third of the thigh on account of injuries of the knee-joint. In one the exarticulation was subsequent to an amputation at the upper third for comminuted fracture of the shaft of the femur. In five cases resections of the necrosed extremity of the femur, or extractions of cylindrical sequestra, were practised in the intervals between the amputations in the continuity and the disarticulations."

One case, known as "Packard's Case," is so remarkable as an instance of what a human being can go through and not die, that we must give the details. Here we find a youth of nineteen sustaining first a perforating gunshot wound of the tibia; in a month he gets secondary hemorrhage, which necessitates amputation of the thigh in its lower third. Another month passes by, and with it another attack of secondary hemorrhage, stayed by ligature of the femoral in Scarpa's space. In less than three weeks necrosis of the femur calls for an operation to remove four inches of the dead bone. This does not stay the necrosis, and after a further lapse of two months the common femoral artery is ligatured after the manner of Professor Porter, and the rest of the femur is removed at the joint. In eight days secondary hemorrhage comes on again, and the external iliac is tied. This ligature separates in three weeks, with profuse hemorrhage, which was only controlled by a direct pressure for fourteen days. After this convalescence was rapid. Surely, both the patient and his surgeons earned well the final success which crowned their patience. It would appear from the results of this war, that the prospects of success are much greater where a portion of the limb has been previously removed. The shock to the system is more gradual and divided.

"Ten cases are on record of disarticulations at the hip-joint after previous amputation of the thigh in its continuity for diseases or for injuries received in the accidents of civil life.

"Eight of these patients recovered and two died, a mortality rate of 20 only. Grouping these ten cases with the seven re-amputations at the hip-joint of the war of the rebellion and with Guthrie's Ciudad Rodrigo case, a series of eighteen examples of removal of thigh stumps by amputation at the hip-joint is obtained, with twelve recoveries and six deaths.

"Of the general condition of those who recover after amputations at the hip-joint, as illustrated by the seven survivors of this operation during

the war, it may be observed that the progress of those who underwent secondary operations was similar to what is observed in patients who recover after amputations for disease. The functions of nutrition were promptly recuperated. Such a subject has been compared to a tree in which one of the principal branches has been looped off, and it has been supposed that the reparative material destined for the member that has been removed continues to be prepared by the digestive organs and gives greater vigor to the remaining portions of the organism. On those persons who have lost a lower limb a comparatively sedentary life is imposed, and hence another cause of a tendency to obesity.

"The rule is reversed in primary amputations for traumatic causes, after which patients commonly became emaciated rapidly, and long remain in a state of feebleness, from which they recover very gradually.

"Of the condition of the stumps of the seven survivors, it is known that in the case of Francis there are sinuses and other indications of disease of the innominatum. Longmore has neuralgia of the stump, and Smith suffers from a sense of congestion of the stump after being long in an erect posture. In the others the stumps are healthy. Ulmer alone wears, with comfort, an artificial limb.

"Of the changes that take place in the pelvis after amputation at the hip, our information is limited to the single case of the soldier whose thigh was exarticulated by M. Sédillot, on account of disease of the femur after a fracture by a fall from a window, who survived the operation twenty-two years. In this instance the acetabulum was obliterated, and its location was covered by a fibro-fatty substance. The articulations of the sacrum and coccyx were anchylosed and deviated to the right. The internal iliac fossa was abnormally hollowed. The anterior superior spine of the ilium was nearer than is natural to the sacro-vertebral angle, and the external wall of the os innominatum had become almost vertical."

We regret that want of space obliges us to defer for the present all notice of the memoir on gunshot wounds of nerves.

In Professor Paul Eve's paper of four pages we have a sufficient amount of matter. He is a favourer of the bi-lateral method of lithotomy.

Clinical Lectures on Addison's Disease, and a Report on Diseases of the Supra-Renal Capsules. By Edward Headlam Greenhow, M.D. London: J. W. Roche, 68, Paradise-street, Rotherhithe. 1866.

We have made rapid strides in special pathology during the present century. Many diseases have been described which were previously

either quite unknown or but very imperfectly recognized, and the diagnosis of many closely allied lesions has been rendered more complete.

Among these virtually, if not in reality, "new diseases," that which forms the subject of Dr. Greenhow's treatise has given rise to considerable discussion; and numerous and very various opinions have been advanced by different authorities concerning its true pathological character, and even with respect to the fact of its existence.

Now, although we think that, previous to the publication of Dr. Greenhow's work, the majority of those whose opinion was worth anything looked upon the existence of Addison's disease as an undoubted fact, we are quite alive to the importance to be attached to the very extended *résumé* of all that is known up to the present time concerning this disease presented to us by Dr. Greenhow.

The work contains a reprint of a report on Diseases of the Supra-renal Capsules, communicated to the Pathological Society of London by Dr. Greenhow, and also two clinical lectures on the same subject, which were originally published in the *Lancet* and *British Medical Journal.*

The object of the investigation on which the report was founded was to demonstrate the connexion between a certain train of morbid phenomena and a particular form of disease in the supra-renal capsules; in fact, to remove scepticism as to the reality of Dr. Addison's discovery. This scepticism is shown to have arisen from the occurrence of two classes of cases—1st, those in which there existed "bronzed skin" during life, and yet the capsules were found healthy on *post mortem* examination; and, 2ndly, those in which there was no discolouration of the skin, and yet the capsules were found diseased after death.

From an analysis of *one hundred and ninety-six* cases, which were either examples of disease of the supra-renal capsules or of bronzed skin without any supra-renal disease, it is shown that they are divisible into two categories. The one containing one hundred and twenty-eight cases in which the morbid change characteristic of Addison's disease was verified by *post mortem* inspection, and in the vast majority of which the characteristic symptoms and external signs of the disease were present during life. The other contained all the cases of bronzed skin without supra-renal disease, as well as those of all other morbid states of the supra-renal bodies, and in this category is included all cases either imperfectly described or

doubtful in nature; and these, with scarcely an exception, were destitute of the signs and symptoms of the genuine disease.

The cases belonging to both categories are arranged in a tabular form:—

"The first column in the table shows the number of the case for convenience of reference, together with the name of the reporter, of the publication from which the report is taken, and also that of the medical attendant on the case, when not himself the reporter. Then follow in order, in the subsequent columns, the sex, age, and occupation of the patient, the previous history and duration of the illness, the symptoms, the colour of skin, and lastly, the results of the *post mortem* examination, both as to the state of the supra-renal capsules and as to the condition of other organs."

The *sixty-eight* cases which form the second category are arranged in four tables, marked A, B, C, and D.

Table A contains all the cases of bronzed skin without disease of supra-renal capsules, amounting to *ten* in number. In only one of these cases were the symptoms of Addison's disease present during life, and in this case the defective description of the *post mortem* appearances renders it useless for any deduction. In the other nine cases the discolouration of the skin was wanting in all the characteristics which mark the genuine disease. Table B includes *twenty-four* cases of cancerous disease of the supra-renal capsules; twenty-two were true cancer, and never exhibited any of the signs or symptoms of Addison's disease, while the other two were instances of that disease incorrectly described as cancer. Table C contains ten cases of miscellaneous diseases of the supra-renal capsules, in only two of which was there any discolouration, and this was not characteristic.

Table D includes twenty-four cases so imperfectly described as to be useless for the purpose of argument.

Of the one hundred and twenty-eight cases of true Addison's disease which are included in the first category, forty-six were virtually uncomplicated; fifteen were complicated with vertebral disease or lumbar abscess; fifty-seven (=44·53 per cent.) were complicated with tubercular disease of different degrees of development and severity; and, finally, there were ten cases complicated with various non-tubercular diseases of the heart, liver, &c. (These are arranged in tables E to N).

Of the above cases the symptoms and discolouration of skin

existed together in seventy-two cases; in eleven there were well-marked symptoms, but only slight discolouration; in thirteen the discolouration was characteristic, but some or all of the symptoms were absent; twenty other cases presented either some of the symptoms, or some discolouration, or both; there remain only twelve cases, two of which were not observed during life; in the other ten phthisis, lumbar abscess, or other predominant disease were apparently the cause of death.

We fully concur with Dr. Greenhow's statement respecting the result of this analysis, "that rarely has a more overwhelming array of facts supported any scientific hypothesis than is here presented in support of the relation between a certain train of constitutional symptoms, attended by discolouration of the skin, and one particular organic lesion of the supra-renal capsules."

All ground for scepticism as to the existence of Addison's disease being removed, we shall proceed to give our readers an analysis of the remaining portions of the work, and in the first place, with respect to the *Semeiology* of the disease, we cannot do better than quote Dr. Greenhow's own description.

He says:—"The manifestations of its existence during life are clearly divisible under two heads—viz.: 1, constitutional symptoms; and 2, external signs."

"I. The constitutional symptoms are: gradually progressive asthenia, often originating without any apparent cause, and seldom dating from any definite period; great langour and indisposition for exertion, with, in advanced cases, breathlessness and palpitation, frequent sighing or yawning, and generally faintness on making any muscular effort, sometimes even on being raised up in bed. There is almost invariably great weakness of the heart's action and remarkable feebleness of pulse; loss of appetite; irritability of stomach, with nausea; and, towards the close of the illness, at least occasional, often persistent, vomiting. The mind is generally clear to the last, but so great is the prostration in the latest stage of the disease that the patient often lies in a drowsy, apparently semi-comatose state, from which, however, he can be roused by questions, and to these he generally gives pertinent, though slow and reluctant, answers. The above I should class as the most characteristic symptoms of the disease; but there are in many cases pains in the loins, hypochondria, or epigastrium; and, more rarely, dimness of sight, vertigo, and, near death, a tendency to incoherence or delirium. Death takes place from asthenia, and often rather suddenly. It is a remarkable fact that, notwithstanding the great debility which is the earliest and most constant symptom of the disease, there is, in uncomplicated cases, com-

paratively little or no emaciation. The skin also is soft and cool; the tongue usually clean and moist until the last days of life; the bowels seldom disordered, though sometimes confined; and the urine generally normal.

"II. The external signs of Addison's disease are found in the discolouration of skin, which, when present in a fully developed form, is, I need scarcely say, its most striking feature. It is true that in a recent case in this hospital, in which the discolouration was very slight, I ventured to diagnose the disease from the constitutional symptoms, and that diagnosis, as you well know, was verified by the *post mortem* examination; but, as a rule, the external signs have been the main ground on which this disease has been hitherto diagnosed. The discolouration of skin in Addison's disease is very peculiar, and gives to the patients in whom it is well marked the appearance of belonging to one of the darker races of mankind. Most frequently it is of a dusky or yellowish-brown, but sometimes rather of an olive or greenish-brown colour. The shade is not uniform on all parts of the body, but is generally darker on the face, neck, and hands, and in the axillæ and groins. The penis and scrotum and the nipples and areolæ are usually the darkest parts of the natural skin, and the discolouration of these last may be regarded as one of the diagnostic external signs of Addison's disease. If the patient have been blistered, or have sustained any other superficial abrasion of the skin, the injured surfaces are always darker than the surrounding parts, but the cicatrices of deeper injuries usually remain pale. Very often, also, small well-defined specks or patches of darker colour, resembling moles, are found upon the face, neck, arms, or trunk; but, so far as I have observed, they only appear on the already discoloured skin. Although the discolouration is generally most marked on certain parts of the body, and may even exist on some parts while the skin of other parts is of the normal hue, there is rarely, or never, any definite line of demarcation between the discoloured and normal portions of the skin; but the former fade insensibly into the latter. The characteristic discolouration is not restricted to the skin, but, in well-marked cases, is also usually found upon the lips in the form of an irregular stain running lengthwise, and upon the gums and buccal mucous membrane in the form of stains or patches; these last may, perhaps, when present, be considered as the most decisive of the external diagnostic signs of Addison's disease. It is, on the other hand, important to remark that the conjunctivæ always remain uncoloured, and in the more deeply discoloured cases their pearly whiteness presents a striking contrast to the dusky hue of the face. I may mention, by the way, that this discolouration of the gums and buccal mucous membrane affords another analogy between the discolouration of Addison's disease and the natural colour of the darker races; two Hindoos who were hospital out-patients of mine

having presented dark stains on those parts, exactly resembling the stains found in cases of Addison's disease. Moreover, in one of them I noticed that some superficial cicatrices were of a darker shade than the surrounding integument."

With respect to the existence of emaciation, Dr. Greenhow's more extended experience leads him to refer the emaciation, which is mentioned in the accounts of many of the cases of supra-renal malasma, published by Addison, Wilks, and others, to the existence of some complication, such as phthisis, or lumbar abscess. In uncomplicated cases, on the contrary, he has found the muscles firm, well nourished, and of a deep red colour, and, in many instances, considerable quantities of yellow fat has been found in different parts of the body.

Particular attention to the characters of the true discolouration is necessary, as various changes in the colour of the skin have been mistaken for that which is pathognomonic of Addison's disease. The absence of the characteristic constitutional symptoms; the existence of definite lines of demarcation between the darker and lighter portions of skin; the presence of dark spots, like moles, on healthy skin; the elevation of the discoloured parts above the surrounding cuticle, are indications of a spurious form of discolouration. The true bronzed skin is darkest on the face, neck, and hands, in the axillæ and groins, and on superficial cicatrices, while the spurious form is generally palest in these situations. The areolæ and nipples are always deeply discoloured in the genuine, but they are of natural colour in the spurious disease. When patches of discolouration are found on the lips, gums, and buccal mucous membrane they are to be regarded as diagnostic of the genuine supra-renal malasma.

We believe that the pearly conjunctiva, to which reference is made in so many of the cases published by Addison and Wilks, is very characteristic, and we think that where it is absent there is little doubt that the case is one of some spurious form of bronzing.

As regards the *Pathology* of Addison's disease, Dr. Greenhow thinks that it may sometimes, at least, originate in inflammation, and he was led to this view from the frequent association of caries of the vertebræ, lumbar, and pelvic abscesses with the supra-renal malasma, and from the existence of deep-seated lumbar pain at the outset of the disease. However this may be, the final result is the exudation of a low-organized fibro-cellular substance which is prone to degeneration, and which is allied to tubercle in the forms of

degeneration, to which it is liable. The frequent existence of tubercle in other organs lends favour to this view.

The relation of the symptoms to the diseased condition of the supra-renal bodies is a most interesting question, but one very difficult to determine. Our author regards the absence of any other disease, in the majority of cases, on *post mortem* inspection, as an argument in favour of the view that the disease and its symptoms stand to each other in the relation of cause and effect, and he inclines to the hypothesis put forward by Wilks and Habershon, respecting the part played by the sympathetic system in the production of the symptoms, but he has not found the enlargement of the supra-renal branches of the sympathetic and pneumogastric nerves to be a general condition.

At the time that Dr. Addison first met with this disease, he regarded it in the light of a form of anemia, and since that time other writers have spoken more or less of an anemic state of the blood. More recently, Dr. Hayden, in a paper published in this Journal, (Feb., 1865), goes so far as to say that "in all the cases in which the blood has been examined, it has been found to contain an excess of white corpuscles, and he regards the disease as in some degree allied to leucocythemia.

To this view, Dr. Greenhow cannot assent, as he has found the red corpuscles in excess, and in every *post mortem* which he witnessed, there were firm discoloured fibrinous clots in the right cavities of the heart.

The *post mortem appearances* present a considerable amount of uniformity, and they are thus described by Dr. Greenhow:—

"The diseased capsules are generally enlarged, hard, and nodulated. On section they scarcely ever present any trace of the distinction between cortex and medulla, or any remains of the natural tissue. It is evident that there has been an exudation which has obliterated the original structure. In a large proportion of the accurately-recorded cases, the appearance of the capsules on section is said not to have been uniform, but marbled by the admixture of two different looking deposits. One of these is semi-transparent, firm, and, when first cut into, of a greyish colour, rapidly assuming a pinkish hue on exposure to the air; the other is generally seen in the form of irregular roundish, opaque, yellow or cream-coloured masses, of more or less friable consistence, embedded in the translucent portion. Often, on careful examination, various gradations will be met with, intermediate between the translucent tissue and the opaque friable nodules, and sometimes there are harder portions of

cretaceous character, either in the form of granules or of larger masses. Sometimes, also, collections of thick, creamy fluid, called abscesses by some observers, are found occupying larger or smaller portions of the diseased organs, which, in exceptional, probably older, cases, are shrivelled instead of being enlarged, and contain only this fluid with a little cheesy matter, or else are hardened throughout into cretaceous masses.

"Under the microscope the translucent portion is generally found to consist of a more or less fibrous basis, mixed with much granular matter, containing shrunken cells and nuclei, some of the nuclei being occasionally elongated into spindle-shaped bodies. The yellow opaque nodules consist, in differing proportions according to circumstances, of amorphous granular matter mixed with irregular-shaped shrunken cells, nuclei, and oil. When the creamy liquid from cavities, or so-called abscesses, has been examined, it has been found not to be true pus, but to consist mainly of oily débris.

"In a large but uncertain proportion of the cases there were evidences of inflammation in the cellular envelopes of the capsules, such as thickening and firm adhesions to neighbouring organs—the diaphragm, liver, pancreas, vena cava, kidneys or stomach—and it is probable that these have existed more frequently than they are reported, but have been overlooked in making the *post mortem* examinations. In some cases it appears evident that the inflammation has originated in neighbouring tissues, and has spread from thence to the cellular tissue surrounding the supra-renal capsules; as in a case (No. 117) in which the patient had suffered from right lumbar abscess some years before his last illness, and, after his death from Addison's disease, a white, fibrous-looking, obliterated sinus was found to proceed upwards from the cicatrix of the former wound to the structures in which the right capsule was embedded. In this case, as well as in another (No. 115), in which the illness had originated in right lumbar abscess, the right capsule was obviously in a more advanced stage of disease than the left. Sometimes, at least, the history of the case seems to show conclusively that the inflammation producing the mischief had arisen from some external injury. In the last of the three cases prefixed to this paper (No. 129), the patient, some three years previous to the apparent accession of Addison's disease, had sustained an injury in the back, from which he had continued to suffer more or less pain during the whole intervening period. In this case, moreover, the injury sustained was on the left side of the spine, and the disease was clearly of oldest standing in the left capsule. In one of my own cases (No. 155) the patient had strained her back while turning a mangle, several years before her death, and dated the failure in her health from that injury. In a third case (No. 119) the patient had hurt his back by a fall eight years before, and caries of several vertebræ was found after

death. In these and other similar cases it appears impossible to avoid the conclusion that the supra-renal disease was secondary to the mischief produced by the local injury."

In only eleven out of one hundred and twenty-eight cases, was the disease confined to one capsule. Of those in which the disease was more advanced in one capsule, the right was farther advanced in twelve cases, while in thirteen instances, the left capsule was most diseased. Thus, we see that Dr. Hayden's observation with respect to the existence of a more advanced state of disease in the left capsule in all cases, is not borne out by a more extended experience.

The seat of the discolouration in Addison's disease is the rete mucosum, and in this respect, it is similar to that which is found in the darker races; this accounts for the fact, that it is only on superficial scars that the bronzing has been observed. The pigment is found in granular masses, arranged in well-defined layers, which follow the undulations of the rete mucosum.

Respecting the conditions which seem to favour the development of the disease, our knowledge is still imperfect, but Dr. Greenhow shows, by his analysis, that it is more frequently found in males than in females, and in the former it was found to occur at that period of life during which hard work was their lot, while in females, most cases of the disease occurred between the ages of fifteen and twenty-five; and, again, between those of thirty-five and fifty. Extremes of age seem to enjoy comparative immunity from the disease. It is most important to note the fact, that but extremely few cases have been met with among the middle or upper classes.

Dr. Greenhow regards this fact as confirmatory of his views as to the probable origin of the disease. He says:—

"Only eight males and three females, so far as can be gathered from the reports, have belonged to the middle or higher classes of society. The facts thus brought out are, the almost exclusive occurrence of this disease among the classes most liable to local injuries from accidents or over-exertion; its much greater comparative prevalence among persons of that sex which is most exposed to these causes of injury; and the pretty equal distribution of the mortality caused by it over the active period of life, to which it is almost entirely confined. These facts appear, at least in some measure, confirmatory of the opinion I have already expressed, based on the history of individual cases, that the origin of Addison's disease of the supra-renal capsules is due, in a hitherto quite

unsuspected degree, to the extension of inflammation to those organs from diseased or injured adjacent parts in persons of a tubercular diathesis."

With respect to *treatment*, something may be done to delay the progress of the disease by combating the asthenia with rest, tonic treatment, and nutritive diet. Excessive exertion and the use of drastic cathartics hasten the fatal issue. Vomiting must be checked by some such remedies as ice, Prussic acid, &c.; and Dr. Greenhow speaks highly of the use of chalybeates, cod-liver oil, and glycerine.

In conclusion, we heartily commend Dr. Greenhow's valuable little treatise to the attention of our readers; the labour, which has been so successfully accomplished, of collecting and arranging such an imposing statement of facts respecting a comparatively newly described disease, must be more than rewarded by the consciousness that he has thereby most amply fulfilled the object he had in view when he commenced his task, namely, "to establish the reality of Dr. Addison's discovery, in order that future inquiries, starting from what is known, may be directed towards the elucidation of the true nature and causes of Addison's disease."

The Principles and Practice of Medical Jurisprudence. By ALFRED SWAINE TAYLOR. London: John Churchill and Sons, 1865. 8vo, pp. 1186.

Principles of Forensic Medicine. By WILLIAM A. GUY. Third Edition. London: Henry Renshaw, 1868. Small 8vo, pp. 655.

MEDICAL students during their years of pupilage doubtless are guilty of many vices—some, we fear, of commission, the majority, we hope, of omission. With those of commission, on the present occasion, we have nothing to do. Of some of those of omission, however, as incidental to a consideration of the works before us, we must speak, inasmuch as the subject of which they treat, is perhaps, of all others in his curriculum, that most neglected by the medical student; and, strange to say, it is equally neglected by the two great classes into which medical students may be resolved—the industrious and the idle—and, stranger still, any one member of either of these two great classes would give diametrically opposite reasons for neglecting this study, the industrious student accounting

for his neglect of medical jurisprudence by stating that its study was too simple, inasmuch as it involves but the application to practice of all the other objects of study to which he has hitherto devoted his attention; whilst the idle student would excuse his neglect by alleging it to be too comprehensive, involving in its successful mastery a pretty accurate acquaintance with every department into which medical science is subdivided. And perhaps, strangest of all, in this view of the subject, the idle student has the advantage of the more industrious one in the argument, as we shall proceed to show, though neither can for one moment be excused for non-devotion to a study, ignorance of which may hereafter ruin his prospects as well as his self-respect and happiness in this world.

A student, who has earnestly worked in his medical and surgical wards and in the chemical laboratory, may well imagine that he is master of all the usual appearances of medical and surgical diseases, and that he is fully capable of recognizing, by their appropriate tests, all the ordinary poisons, and yet may he prove a specially bad medical jurist. We speak not now of a medical witness, but of a medical jurist; and of the truth of this statement numberless proofs could be adduced. How many are the students who carefully examine into the condition of a bad compound fracture, subject the limb to the most minute clinical investigation, and who never dream of examining the patient's clothes, and yet upon such an examination may hereafter hang questions of life and death! Such a man may be competent to pronounce an admirable opinion as to the propriety of primary or secondary amputation, but certainly as a medical jurist he would signally fail.

Again, a man may be an admirable toxicologist, be capable of detecting the presence of arsenic or strychnia in infinitesimal proportions even in organic mixtures, and yet from inattention on his part to some trifling minutia, the most flagrant criminal may escape the bounds of justice. Every test may be conclusive, but the one connecting link be wanting, and all this from neglect of a study which "will he nill he" may be forced upon his consideration. Men may devote themselves to a specialty—some to surgery, some to medicine, some to midwifery—and consequently claim an exemption from all other pursuits; but no one, no matter what be his specialty, can hope to get through an active professional life without, at some one period or other of it, figuring on the green cloth as a medical witness; and to do that with credit to himself and

with advantage to the community, he must make medical jurisprudence a portion of his study.

Having mastered the study of medical jurisprudence, another task remains—to become a good medical witness. How often does it not fall to our lot to witness an honourable, high-minded, accomplished physician or surgeon making a miserable exhibition of himself and of his profession in the witness box! and all this from want of previous education in this department of his professional duties. 'Tis true that all medical witnesses have a great difficulty to contend with—a difficulty that never is readily acknowledged by their examiners, and that is the most profound ignorance, on the part of the *profanum vulgus*, of all matters medical—a difficulty much enhanced by the use, on the part of medical witnesses, of medical terms—terms familiar to them, and with which they fancy every one should be familiar, but of which the public are all profoundly ignorant. Never can we forget a scene in court of which we were once witness. When in a disputed insurance case, the term "rusty sputa" was used by the medical witness in describing the phenomena of pneumonia; "rust*a* sputa" was over and over repeated by the barrister, and the Court, who, with the greatest difficulty, were at last made to comprehend this most incongruous piece of medical nomenclature. Another and still graver offence, on the part of the medical witness, is taking up the position of an *advocate* and abandoning that of a *judge*, which should be his proper function. The medical witness, on all that concerns the medical portion of the case, should be a *judge*—he should be above all prejudice; his evidence should be decisive, founded on truth, and irrespective of either side. "To tell the truth, the whole truth, and nothing but the truth;" as it is his obligation, so should it be his study. No matter whether it acts for or against the side upon which he is employed, it is his duty to tell it, and eventually by so doing will he gain the greater reputation, and, above all reputation, will he gain the reward of an approving conscience. Nothing tends more to injure our profession in public estimation than seeing its members appearing in our courts of justice as partizans. One set of medical experts appearing as the supporters of one view of the case, whilst another equally warmly advocates the very opposite. That there are always two sides to a question may be accepted as a truism, but truth must lie on one side rather than on the other; and what is to be deplored, so far as medical science goes, is that our members should be pitted against each other in support of

views diametrically opposite The time will surely come when all such questions will be submitted to the decision of a tribunal competent to decide knotty points of medical jurisprudence—a tribunal composed, really in the truest sense of the words, of *medical experts*, who will not permit themselves to be led away by medico-legal sophism, and in whose eyes medico-legal sciolism will find no favour; until this, the good time comes, it behoves our professional brethren to provide themselves with works which will enable them to acquit themselves with credit in such emergencies; and it is rather a proud thing to state that English literature affords them two distinct treatises upon this subject to select from, either of which may confidently be looked upon as being up to all their requirements.

The really magnificent work of Dr. Taylor is an amplification of his previous treatise on medical jurisprudence, which had already passed through seven editions. In stating this fact, the duties of the reviewer may be considered as discharged. A work which has successfully passed the ordeal of seven successive editions is independent of any editorial praise, but we cannot deprive ourselves of the pleasure of congratulating Dr. Taylor on having added to our medical literature a work which for years to come must be looked upon as one of our standard classics—a mine into which labourers yet to come will sink many a reproductive shaft. In the present work, however, subjects are discussed at far greater length, more exhaustively, than its limits would permit to be done in the manual. Many such topics might be adduced in evidence of the truth of this statement; we shall content ourselves, however, by referring our readers to the observations on medical evidence, life assurance, and spontaneous combustion. In stating our conviction that this work will be found on the shelves of every criminal barrister in any practice, we think we will have said quite sufficient to show the urgent necessity that exists for any medical man who goes into a court of justice as a witness, to make himself also familiar with its contents.

Dr. Guy's work, whilst not so pretentious, is, perhaps, more suited for the actual requirements of the student; thoroughly up to the *facts* of medical jurisprudence, it is not so full of details, and it appears to us to be more suited for employment as a handbook for reference by the student employed in attendance upon lectures upon these subjects. Both works are profusely enriched with illustrations, and either will amply repay the study expended upon their perusal.

Gout and Rheumatism in relation to Disease of the Heart. By A. W. BARCLAY, M.D., Cantab. and Edin.; Fellow Roy. Coll. Phys.; Physician to St. George's Hospital, &c. Pp. 214. London: John Churchill and Sons.

DR. BARCLAY'S attention to the subjects of gout and rheumatism and the investigation of these diseases, are not, as he reminds the reader in his preface, of recent date, since, as Medical Registrar at St. George's Hospital many years ago, he had paid particular attention to these very subjects. The results of his observations at that time, made on the numerous cases which passed under his notice, have been published in the 31st and 35th volumes of the "Transactions of the Royal Medical and Chirurgical Society," and have been placed before the profession as the groundwork of the rules for diagnosis in his "Manual of Medical Diagnosis," for the use of students.

The work before us is, manifestly, the produce of no hasty premature opinions—of no crude suggestions of an untrained mind—of no book-making mania, so seductive to many in these days—but the result of many years' hospital experience, and careful and thoughtful study of these particular subjects. It does not, however, treat of them exhaustively, nor of many of their most interesting and intricate phases, but mostly on their bearing and relation to disease of the heart. Dr. Barclay prefers this method to adding another to the already existing monographs on heart disease. His views on the subject of gout are not in harmony with those of many who had contributed much to our present knowledge; yet still M. Trousseau, Dr. Gairdner, and others have already expressed much that is in accordance with his own.

While to Dr. Garrod we owe the certainty of the existence of an excess of uric acid in the blood during a gouty paroxysm, and its absence in rheumatism, yet

"It is far too mechanical a view to suppose that gout is nothing more than an accidental excess of uric acid in the blood: that the inflammation of the joint is simply the effect of the same acid in the form of urate of soda exuding through the vessels, and irritating the ligamentous and synovial structures. The fallacy of such reasoning becomes more apparent when we find Dr. Garrod asserting 'that true gouty inflammation is *always* accompanied with a deposition of urate of soda in the inflamed part.' So far as it is possible to trace the reasoning by

which such a conclusion is arrived at, it might be stated as follows:— Gout is essentially known to us by the inflammation of the joints, and this consequently is true gouty inflammation. Any joint so attacked has been found on examination to bear traces more or less distinct of the deposit of urate of soda. Hence all true gouty inflammation is accompanied by this deposit. I need only appeal to Dr. Garrod's own logical faculty to admit the fallacy of the argument so stated, and I do not find that he has anywhere brought forward further proof of his assertion.

"It is indeed quite true that in the case of the joints we find the existence of gout, the local inflammation, and the deposit, all harmonizing together; but does it necessarily follow that if, during the existence of gout, inflammation of any tissue does not present the same deposit, it must be excluded from our idea of the disease? Must we of necessity find urate of soda in the stomach and the bronchi before we can admit gouty gastritis or gouty bronchitis? Must we again assume that as 'the deposited urate of soda may be looked upon as the cause, and not the effect of the gouty inflammation,' no gouty inflammation can occur till such a deposit has taken place, and that it must have happened wherever it exists? Such assumptions make large demands on our belief, and to me it appears that the very fact that urate of soda is not found in parts such as the bronchi, where an inflamed condition of the membrane is so often associated with gout, is of itself a proof that 'true gouty inflammation' is not always associated with or caused by the deposit. This conclusion acquires additional force from the consideration, that though the deposit and the inflammation are associated together in the joints, the urate of soda is seen in other parts without any evidence of its exciting inflammation there."

There must be something more than the chemical agency at work—the hereditary tendency, the suspension of the functions of the kidney during the attack without any evidence of disease, the sudden cutting short of the disorder by specific medicines, and not by medicines chemically suited, as well as the pathological conditions found in the albuminous urine, the degenerated kidney (hence called gouty by Todd), the enlarged or cirrhosed liver, all which are sometimes found associated with gout, and, again, as often found to exist in cases entirely free from gout—all point to something more than mere excess of uric acid in the blood as the cause, something further back which can produce these degenerations.

Dr. Barclay in his views on this subject concurs with that of M. Trousseau, although no mention is made of the latter. He cannot believe that the excess of uric acid and the urates constitutes the *materies morbi*, for if such were really the cause of

the disorder, they ought to appear in gout, and gout alone. This is evidently not the case; for besides the fact—which Dr. Garrod has himself demonstrated—that uric acid exists in the blood in persons in perfect health, in variable quantities according to the time which has elapsed since the last meal, he mentions other diseases in which uric acid and the urates are found as well as in gout. In the first stage of intermitting fever the uric acid diathesis can be discovered by making an analysis of the blood.

"These results," M. Trousseau says, "will not permit the acceptance of the identity which they wish to establish between the gouty diathesis and the uric acid diathesis, since this diathesis is only one common to different diseases which have this point only in common." He further says—"La production de l'acide urique et des urates en excès est un phénomène pathologique inhérent à la maladie comme tous les autres, et comme tous les autres il est dominé par une cause spécifique, que nous ne connaissons que par ses effets, et que nous appelous la *diathèse goutteuse*."[a]

For this "specific cause" Dr. Barclay looks to the blood:—"The first change must be in the molecular structure of the blood itself."

Looking at the analogy which seems to exist between the kidney affection, the degenerations of the liver, and other tissues in the body found in gout, and those produced by the excess of alcohol in the drunkard, he says:—

"It seems impossible to doubt that the first departure from health, or at least from a condition compatible with health, must be found in an altered condition of the blood. It is to be remembered that there are several series of changes going on in that fluid from day to day, some of which are quite transitory, while others are more or less permanent in character. First we have changes in the condition of the serum, which are in progress every hour; it contains more or less water, saline substances, nutritive material in a state of solution, and effete matter. In a very few hours a large quantity of water may be got rid of by violent perspiration, excessive kidney secretion, or bowel flux. A very few minutes serves for the transmission of a saline substance from the stomach to the kidney, where it may be traced in the urine; and if taken in larger quantity, two or three hours will suffice for many salts to pass off by the bowels. Excrementitious particles are more slowly got rid of by the various secretions, and the nutritive elements probably remain a very much longer time before they are converted into tissue of any kind;

[a] Clinique Médicale, par A. Trousseau; Troisième Ed.; Tome Troisieme, p. 352.

and no doubt a considerable amount of this material never gets any further than the blood, but it is used up there for other purposes—that of respiration, for example—without ever being actually and directly applied to nutrition. Another series of changes is connected with the formation, alteration, and disintegration of blood globules and colourless corpuscles. That these are sometimes very rapid in their progress I see no reason to doubt, but still they must be regarded as being more stable and permanent in their character than the changes which go on in the blood-serum. Now it would appear that the various stimulants taken up into the blood and passing round in the circulation act in one man more injuriously on the brain, in another on the liver, in another on the kidney, and as a consequence of this injurious action being long continued and repeated, serious, or even irreparable organic change at length takes place. In the very same way I think it must sometimes happen that the blood globules themselves are injuriously affected, as, for example, by the repeated introduction of the gout-producing elements into the circulation."

This hypothesis requires as yet the means of being confirmed or contradicted, and so far as a speculation its value is but little, but when we turn to the treatment of the disorder it ceases to be profitless. According to the above view the retention of uric acid is but a symptom or consequence of the attack of gout, and not its cause. The good living and the stimulants do not simply cause an excess of uric acid to be formed, but they end by causing some more permanent change, and, probably, one affecting the blood globules ; which reacts on the kidney, putting a stop to the excretion of uric acid, and causing its retention in the serum, where, passing in the round of the circulation, it is very apt to become deposited as urate of soda. According to the chemical view, a perfect alkalescence of the blood and urine ought to arrest the disease; yet, experience tells a different tale, for no amount of artificial alkalescence will put a stop to the paroxysm when it has once commenced, and in old standing cases the subacute inflammatory condition will last for months, in spite of all alkaline treatment fully and fairly carried out. Dr. Barclay does not by this mean to deny " the great benefit of the alkaline treatment as a prophylactic, and as a remedy to prevent worse evils following in the train of the disorder, but still it seems only to modify the severity of the seizure without arresting its progress. While the shortest experience in treatment proves, beyond all question, that when, in acute gout, colchicum is *first* administered, its action is something perfectly different from the effect of the administration of alkalies. By this remedy the disease appears to be immediately

arrested, the existing inflammation subsides, no fresh joint is attacked, and in a few days the patient is well."

In Chapter II., when discussing the relation of acute rheumatism to disease of the heart, he is almost necessarily led beyond its immediate relation to call attention to the confusion which, alas, only too generally exists in the minds of members of the profession on the subject of chronic rheumatism and gout. He gives Dr. Adams all the credit he deserves for the distinction between these diseases, and very properly repudiates the term—too often the cover of ignorance—rheumatic gout. It is much to be desired that "rheumatic gout" should be wholly banished from medical nomenclature as being one of those terms which only give rise to confusion and impede advance.

The proportion of cases of acute rheumatism in which the heart is affected has varied greatly from the time of Bouillaud to the present. The per centage of cases of carditis, according to that great physician, was as high as eighty-six. Dr. Barclay's own observations, fifteen years ago, as published in *Medical Chirurgical Transactions*, gave forty-four per cent. For the fact that Dr. Fuller, a few years previously to Dr. Barclay, in the same hospital, gave a higher per centage, and Dr. Dickenson, recently (1862), gives a still lower, we must look for an explanation to the improved method of treatment, and to the fuller and more perfect acquaintance of the physician with the disease. Age seems to have the most important weight as to the chance of heart complications, as in childhood it may be said, any rheumatic attack presenting febrile symptoms is likely to be accompanied by inflammation of the heart, while after adult life is complete, a very marked febrile and inflammatory character must accompany the disorder before there can be the smallest probability of cardiac inflammation.

The question of discriminating an anemic murmur from an organic one, while it is acknowledged to be a difficult one at all times, is peculiarly so when in the course of acute rheumatism it makes its appearanee for the first time. On this subject Dr. Barclay's remarks are very sound and instructive. His opinion as to situation is, "that functional murmurs are especially vague in their site, and that it is almost impossible to fix on any spot where they attain a maximum of intensity; whereas organic murmurs always have a point of origin and of greatest intensity, with the single exception, perhaps, of some regurgitant aortic murmurs."

Until recently an anemic murmur occurring at the apex has been

always set down to an organic change. A more accurate acquaintance with the use of the stethoscope has shown that such a murmur does sometimes exist, and has for its cause perhaps, most frequently, the effects of acute rheumatism. Dr. Barclay's explanation of blood murmurs heard in the heart, and the conclusions he has been led to by his auscultatory experience, we subjoin in his own words:—

"Much confusion seems to me to exist in the minds of writers on this subject, because of their assuming that a blood-murmur must be produced at a valvular orifice. If the valve be sound it has really nothing to do with it, and any theories which attempt to explain its production by alterations in the form of the heart, or by perverted innervation or disordered contractility of the valve are really useless. It matters not whether the patient be blanched in appearance or have a florid aspect; if a blood-murmur can be produced by slight pressure on the carotid, a similar murmur must be produced in the heart. There is no roughness or unevenness of surface in the carotid, there is merely a narrowing of the passage, so there need be no roughness or unevenness at the outlet of the heart, the mere narrowing of the channel must of itself be sufficient. And when the tendency to be thrown into vibration is great, it need not be restricted to that situation. In point of fact, the vibration is very generally produced before the blood reaches it. Careful auscultation will generally trace it in the cavity of the ventricle itself, probably excited there by the contact of the muscular bands which everywhere project from the surface.

"Attention has been of late turned to this point, and various suggestions have been made as to the mechanism of murmur at the apex which was not dependent on organic disease of the mitral valve. Many years ago it came under my own consideration, before I had seen any notice of the subject by others. I had been taught that a murmur at the apex indicated mitral regurgitation, and that mitral regurgitation implied valvular lesion, and I was forced to unlearn this teaching by unbending facts. In its place the following conclusions were arrived at from the observation of a large number of cases, and they are here suggested for the consideration of others, though they cannot be regarded as proved. First, that mitral regurgitation does always imply insufficiency of the valve, but not always disease. Secondly, that a murmur at the apex does not always imply mitral regurgitation.

"But if there be not regurgitation, how are we to account for murmur at the apex? The answer must necessarily be hypothetical. In examining with great minuteness all the blood-murmurs that came before me, the first and almost inevitable conclusion was that they did not present the character of having any definite point of greater intensity. Further, that though diffused, there was very generally a limited area in which,

though not quite local, they were heard louder than elsewhere: and that this was sometimes at the second intercostal space, sometimes over the centre of the heart, sometimes towards the apex. It was then noted that these regions of greatest distinctness corresponded to intercostal spaces, and I arrived at the conclusion that this was one of the localizing circumstances. It was further observed that when the murmur was heard very distinctly at the third, or more especially at the fourth intercostal space, and less distinctly at the second, the breathing sound was audible at the higher point, and absent over the surface of the heart; and that the further down the breathing was audible, the more did the blood-murmur seem to be produced at the apex. In short, the conclusion arrived at was that though functional murmur is most commonly heard when the blood passes from a cavity to a tube, yet it may also be produced in the cavity itself, and that the chief localizing circumstances are these: first, its tendency to be produced at the commencement of a tube, whether aorta or pulmonary artery; second, its being loudest when the lung did not interpose between the blood and the ear of the listener; thirdly, its being more readily transmitted through the intercostal space than through the rib."

Of the beneficial effect of alkalies in the blood, as preventive of cardiac complication, Dr. Barclay has no doubt, though as to how this is brought about he offers no explanation. The converse of this treatment—that is, the omission of alkalies, as exemplified in the mint-water treatment of Dr. Gull in Guy's Hospital—presents a sad contrast. Although statistics are at all times troublesome things to deal with, and too often fallacious guides, yet still, when made on similar cases in London hospitals, the results of comparison throw considerable weight into the scale against the do-nothing system of Dr. Gull. Of forty-one patients subjected to the mint julep treatment, there were eleven in whom the heart was known to be diseased, and included six cases of pericarditis; while in forty-eight cases put under the full alkaline treatment, as published by Dr. Dickenson, only one had pericarditis commencing after treatment was begun. Although some of the former cases of inflammation had commenced before admission to hospital, yet the difference between the two, admitting all possible contingencies, is still too much in the favour of the latter method.

Dr. Barclay's own experience asserts:—

"I may say with confidence, that in my own practice, the lighting up of inflammation of the heart, after the system has been fully brought under the influence of the alkali, is one of the rarest events in pathology.

This experience, to one who has been in the habit of watching the condition of the heart in all the cases of rheumatic fever in the same hospital fifteen or twenty years ago, is most striking, and needs no confirmation from statistical calculations."

The chapter devoted to the inquiry into the so-called metastasis of gout is worthy a more full analysis than we can give it, as it puts the erratic character on its proper footing. In a person predisposed to the complaint, the joint affection in gout may come on, we know, excited by some blow or strain, or without any such exciting cause. Experience teaches us that the cause, be it what it may, operates sometimes on one joint, sometimes on several, attacking them either simultaneously or in succession. The inflammatory action, when it does not pass a certain stage, leaves the joint to all appearance just what it was before the attack, in a very few hours after the irritant ceases to act upon it.

"A very analogous process is seen in the disease known as pyemia. Here, again, there is some material circulating in the blood which tends to produce local disease in various parts of the body, which are attacked either together or at successive periods: inflammatory action is set up, and the tendency of that inflammation is to the formation of pus. When pus is really formed, a considerable period must of course elapse before there can be a return to a state of health, even under the most favourable circumstances; yet instances constantly occur in which some one or more of the parts attacked never pass beyond the first stage, and all trace of inflammation subsides in a very few hours. I do not know that any theory has fully explained why pyemia attacks one organ of the body more than another; but there must be some localizing influence that determines it to the skin in one person, to the liver or the lungs in another. Here the analogy seems almost perfect, and may perhaps help in suggesting an hypothesis which will serve to guide our views to some extent in considering the transition of gout. Let us not, however, carry it too far: the collections of pus once formed in a case of pyemia are very different from the gradual accumulations of urate of soda; and the one disorder attaches itself to its victim for life and descends to his posterity, while the other, when subdued, quits its hold altogether. But just as in pyemic cases, patients may escape the pus-formation in some of the inflamed centres; so it seems highly probable that sometimes in gout the attack may be so transient as to leave no trace of chalky deposit.

"If these two considerations receive their due weight, we shall have no difficulty in accounting for the rapid transference of its attacks without the necessity of assuming that its subsidence in one part is necessarily connected with its appearance in another."

We entirely agree with Dr. Barclay in his disapproval of the continuance of a phrascology which supports hypotheses having no foundation in fact, but which are kept up by the language in which they are couched at the present day, and which tend to lead away the mind from the realities with which alone medicine ought to deal. It is inconsistent with our advanced knowledge of pathology to suppose that if an internal organ be affected, while the joint simultaneously seemed to return to a state of health, the disease had departed as an entity from it, and fixed itself on the internal organ.

In cases of gout the series of symptoms referable to the heart differ very materially from those in connexion with acute rheumatism. The liability to inflammation is very slight, and the occasional deposit of lithate of soda seen on one or other of the valves is no evidence that it resulted from inflammatory action, but like the gouty incrustations on the external ear, it is only one form of mal-nutrition attendant on the diathesis. The valves are generally atheromatous, if any disease be present, and there is never any trace of the previous existence of pericarditis at all analogous to that which remains so often after acute rheumatism. As M. Trousseau remarks, it is not the endocardium which is first attacked, but the tissue itself. The affection has, as regards the heart, the same transitory character as in other parts of the body: sometimes characterized by spasm, which lasts but a very short time, and seems of such intensity that life must cease if immediate relief be not obtained; sometimes seen in irregular action which may last for days; but in either case leaving no trace of its past existence in organic change. Should, however, the organ be previously damaged, the danger and importance is much augmented, especially in feeble or fatty hearts, when the walls are degenerated. This spasm of the heart, the only other we know to Angina, throws the sufferer into perfect prostration; yet differs from it, for while in the one sudden death is not infrequent, in the other it is comparatively unknown.

In closing his remarks on the treatment of gouty affections of the heart, which are rather on the indications for treatment than the treatment itself, he lays great stress on the effects of colchicum. He warns his readers against the almost certain injurious effect that drug produces when administered to patients in whom gout has attacked an internal organ. The striking effect colchicum has in arresting early attacks tend to make the physician sometimes

forget the general symptoms of frequently repeated attacks of gout; and he strongly advises that in such cases our efforts should be directed to restore healthy secretion before attempting to arrest the disorder.

The perusal of this little work has given us much pleasure, and we are sure a book, so evidently the result of much time and sound thought, devoted to the subject of disease of the heart, will win the attention of every reader, and suggest to his mind much material for consideration.

A Compendium of Practical Medicine and Morbid Anatomy. By William Dale, M.D., Lond.; M.R.C.S.E. London: John Churchill and Sons. 1868. Duodecimo.

To those readers who wish only to get a smattering, superficial acquaintance with disease, its pathology and treatment, and have no time or inclination to study the matter deeply and soundly, a small book on medicine is always acceptable. Dr. Dale, in the preface, says he hopes that his compendium may come under the head of being "little." We certainly think he has attained his object, as in 467 pages he has treated of the symptoms, physical signs, treatment, morbid anatomy, and, in many instances, the history of almost all the diseases found in nosological works, with the exception of diseases of the skin, eye, and ear. It cannot, therefore, be wondered at if there be a great superficiality, and if, in the desire to be concise, omissions be found—and this, we must confess, we felt as we read its pages. It is, not, however, without its merits, as in many places we read with pleasure the results of Dr. Dale's note-books, or, he says, "the gleanings compiled from the works of others and the periodicals." We regret, however, that some of the most recent and instructive discoveries in the pathology and treatment of disease should be altogether passed over unalluded to, and diseases the most important and abstruse dismissed in a few lines. For instance, one page only Dr. Dale devotes to the subject of hemiplegia, while even more than a page is given up to the description of the laryngoscope, an instrument in the hands of, and thoroughly understood by, every intelligent physician and surgeon.

Besides numerous typographical errors, which a little more careful attention to the proofs might have avoided, we find his style too loose and inaccurate, especially in his chapters on the nervous lesions.

Beyond mere allusion to the epidemic of cerebro-spinal meningitis which commenced in Ireland in 1866, and of which we have still many cases lingering amongst us, no practical information is given, nor is that peculiar feature of purpuric eruption, which has given rise to so very general interest throughout the country, discussed.

Again, his description of epilepsy and locomotar ataxy are very poor and faulty, as in that of the former the *petit mal* is not mentioned, and in the latter he has evidently not been practically and personally acquainted with this interesting malady.

Without wishing in the least to make little of Dr. Dale's exertions to write a book, nor overlooking the many well-written passages and the sound treatment detailed therein, we must, however, say that in our opinion such a book was not wanted to fill a gap, since many similar books of equal, if not greater, pretensions, exist under the names of "Vade-me-cum Manuals," and must only end in being added as another to the already too long list of superfluous literature to be found in our profession.

First Principles of Medicine. By Archibald Billing, M.D.; F.R.S.; &c. Sixth edition, Pp. 714, octavo. Bell and Daldy. 1868.

We feel it quite unnecessary for us to make any lengthened review or critical analysis of a work which has reached its *sixth* edition, and which has already been translated into two foreign languages, as well as republished in America. Dr. Billing's views have been now in print for many years, and while they have not gained, and, we venture to say, never will gain, in every point universal assent and agreement, still they commend themselves to the reflective and cause-searching members of our profession, as well for their actual clinical value as their originality. As a book on the practice of medicine, it deals with disease as something more than a name, and tends to stimulate the reader to a more accurate observation of the ills that man is heir to, and a more reasonable consideration of the remedies and treatment required for their cure or alleviation.

Although this work, as plainly indicated in its pages, has for its author a man possessing a well-educated mind, of extensive literary attainments, and reasoning, thoughtful disposition, we

can see plain evidences of ignorance, or, at best, defective appreciation of some of our most recent physiological discoveries and therapeutical researches, and we cannot but feel disappointed with the manner in which the writer deals with others whose opinion differs from his own, showing as he does too often a spirit of egotistic dogmatism, and unkind sarcastic raillery, instead of that humble, indulgent manner in which our greatest writers are wont to treat those at variance with them.

Dr. Billing still maintains his original views on cholera unaltered. He considers it a fever, and his treatment is sedative (in opposition to that of elimination by castor oil and other purgatives) by one-tenth of a grain of tartar-emetic and twelve grains of sulphate of magnesia every half hour. The remarks on heart disease, and the information as to the sounds of the heart, are excellent, placing them in their proper light, and giving them their due significance as indications for treatment. We observe, however, that the "pre-systolic bruit," so much talked of just at present, and of which every careful observer ought to be satisfied in his own mind, finds no place in his account of the murmurs. The chapters on hysteria and mental disease, so far as they go, are newly written and well handled, well worthy the attention of those interested in such subjects.

Lectures on Venereal Diseases. By W. A. Hammond, M.D.

Venereal diseases have been the theme of many discourses from the earliest times, without, however, producing much effect, either upon their frequency or severity. Fortunately an influential society has at length sprung up in Britain, with the avowed purpose of checking the spread of these maladies. No duty is more noble, and none has been more distinctly claimed by medical men, than the prevention of disease. In no direction is the exercise of this duty more loudly called for than in the case of syphilis, one of the most widespread and odious of maladies. A disease not confining itself to its immediate victim, but propagating itself, by different channels, in innocent wives, mothers, and children. The time is happily fast passing away, if it have not already disappeared, when misplaced sentimentality, or mistaken views of morality, can any longer prevent the application of the well known rules of sanatory science to this, as to other contagious disorders. The work of Dr.

Hammond consists of twenty lectures, prepared for his class at the Baltimore Infirmary. They are, of course, rather discursive in style, and do not pretend to be a complete treatise on the subject. The palm in that respect is frankly yielded to Dr. Bumstead's excellent book. The author claims to embody, in a small compass, the main practical points and doctrines on venereal disease, and to publish some results, based upon his own experiments, of a novel and important character.

The views held by the author regarding syphilis are, that the two species of chancre, commonly styled soft or non-infecting, and hard, infecting, or Hunterian, form two distinct maladies, inheriting a common name, in consequence merely of a common origin. He believes them to be radically different in their local aspect, the course they run, and their subsequent effects upon the constitution. In short, he is a Dualist pure and simple. He believes the soft sore requires only local treatment, and recommends Ricord's carbo-sulphuric acid paste as the best caustic; while he believes that the hard chancre, when it has time to develop itself, inevitably requires the administration of mercury for the cure of the symptoms it entails. He believes further that the excision or complete cauterization of an infecting chancre within the first six days of its appearance will prevent further infection. With respect to mercury he mentions that in the earlier portion of his career he was an anti-mercurialist, being deeply imbued with the doctrines and teaching of Guthrie, but that he found this plan did not answer his expectations, and he now frequently gives a course of mercury during a period of four or five months, or even longer. The author, however, readily concedes that in many cases of syphilis no specific treatment is necessary. Having laid down as an axiom that every disease which is curable by medicine is curable without it, the writer goes on to say:—

"I believe mercury, properly administered, is as antagonistic to the syphilitic poison as cinchona is to intermittent fever. I do not intend to be understood as saying that syphilis cannot be cured without mercury, any more than I would say that intermittent fever cannot be cured without cinchona or some of its preparations. On the contrary, I hold directly the opposite view, and I believe that mercury, as it is often used in the treatment of or as a prophylactic to syphilis, does much more harm than good. But I am, nevertheless, equally sure that when properly employed, with due care to avoid their injurious effects, we have—besides destroying the chancre—in the preparations of mercury the only prophylactics against constitutional syphilis, and the best agents we can use in its cure."

Whether mercury, however early administered, can ensure the non-appearance of secondary symptoms in a case of true infecting chancre, is open to much doubt. But there can be little hesitation on the score of the differing intensity of attacks of syphilis in different individuals. Some, it may be, suffer from a mild rash on the skin, accompanied with slight sore throat, and preceded by trifling rheumatic pains, and then they have no further trouble, whether they have been submitted to treatment or not, while others suffer in the most intense degree, from the severest symptoms, and are only relieved by persistent, and long-continued active treatment.

The author's views, on the nature and treatment of chancre, although open to criticism in some minor particulars, are those entertained by a very large and increasing number of surgeons. Indeed, to the writer of the present remarks the difficulties in the way of the unicist theory seem so great, while the points in favour of the dualist view are so numerous, that the latter appears to him to be the best, if not the only, hypothesis to reconcile the many conflicting testimonies to which the discussion of this subject has invariably given rise.

Of course, as to syphilization the author does not believe either in its desirability as a means of cure, or in its feasibility as a preventative measure. It is in reference to gonorrhea that the opinions held by Dr. Hammond differ materially from those of almost all his brethren. Up to the time of Hunter no definite distinction was made between gonorrhea and chancre, nor between chancres themselves. Gonorrhea was considered capable of producing constitutional syphilis. The experiments of Ricord appeared to have finally decided the question that gonorrhea was incapable of producing syphilis, and that they were totally distinct disorders, and his conclusions are almost universally endorsed. Dr. Hammond, however, believes and cites cases, too long to quote, in justification of this belief, that gonorrhea may be induced, first, by the virus of hard chancre, and secondly, by the virus of soft chancre, when the chancrous matter has been deposited for a certain length of time upon the mucous surface, without any abrasion being present, or without any chancre following. Vaginitis and urethritis may, he says, be induced by other causes, but true gonorrhea owes its origin to the contagion of chancrous pus alone. He further adds that the gonorrhea induced by the matter of a hard chancre will be followed by, and may impart constitutional syphilis, just as if a chancre had been present. Dr. Hammond gives many and most interesting cases in

support of his views. Those who dissent from them will say there had been an unobserved indurated chancre, and that it was from this, and not from the gonorrhea, that the constitutional lesions were derived. Dr. Hammond asserts that the most careful and repeated observations utterly failed to detect a breach of surface anywhere, and that, in point of fact, he feels certain there was none. No more interesting or remarkable history could be found than that related on page 232, and the pages following. It is too long to quote in detail, and to epitomize it would be to rob it of much of the internal evidence of its truthfulness. The conclusions arrived at by Dr. Hammond are:—

"1st. That the virus of an infecting chancre, when deposited on a secreting mucous surface upon which there is no solution of continuity, may give rise to gonorrhea unattended by chancre, but which is syphilitic in its character, and capable of producing constitutional disease.

"2nd. That the matter of such a gonorrhea is capable of causing an infecting chancre, either by natural or artificial inoculation, which chancre is followed by constitutional syphilis."

Similar propositions are made about soft sores.

Whether we admit Dr. Hammond's views with reference to gonorrhea and syphilis, we are not debarred from otherwise admiring the pleasant readable lectures in the book we have just closed. The author is a man whose experience has been unusually large both in military and civil practice, who has an observant, philosophical, and candid mind, and who is neither afraid to form, nor to express an independent opinion.

Injuries and Diseases of the Jaws—The Jacksonian Prize Essay of the Royal College of Surgeons of England, 1867. By CHRISTOPHER HEATH, F.R.C.S., Assistant Surgeon to University College Hospital, &c.

THIS is something more than a mere prize essay, excellent as many of them are now-a-days, and more especially those of the Jacksonian Prize series. It is the work of a practical surgeon of no mean repute already, and giving promise of, we hope, a long career of useful and profitable industry. Mr. Heath is well known to the readers of this Journal by his contributions to its pages, and by our notices of his works on anatomy and on minor surgery and

bandaging. The present work bears intrinsic marks of diligent investigation, and of a fair acquaintance with the literature of the subject, both recent and more remote. Mr. Heath is specially familiar with the records of Irish Surgery in this department. We find remarkable cases from the practice of Crampton, Cusack, Adams, Butcher, Collis, Fleming, Hutton, and R. W. Smith, quoted and intelligently remarked upon; while the museums, both metropolitan and provincial, have been carefully searched, and records of transatlantic cases have not been forgotten.

The illustrations are numerous and good; some of them are familiar as occurring in Mr. Fergusson's writings, to whom Mr. Heath was for some time house surgeon, but the majority are original. We would especially point to the series which illustrate the varying forms of the antral cavity, as important by drawing attentions to variations of structure which influence the forms of disease. Thus we have the natural outline of the cavity, a "triangular pyramid," with the base to the nose and the apex to the malar bone. We have it varying in capacity holding in one case $2\frac{1}{2}$ drachms of fluid, in another an ounce. We have it unsymmetrical, subdivided more or less completely into two or more cavities, with one or more apertures, natural, or the result of disease and so on. Each of these and of other variations is duly illustrated, and explained.

As something has lately been made of sub-periosteal resection, we give the following extract, which seems to show that under a new name we had been dealing with an old friend. Of this practice of surgical re-discovery we expect to have always some complaint to make; all we can say is, it is better to re-discover than to forget what is good.

"Under the name of 'Sub-periosteal Resection,' operations have been described by foreign surgeons, which in no respect differ from the extraction of sequestra as ordinarily practised, of which the following case, extracted from the *Lancet*, of 1863, is a good example:—'M. Rizzoli, of Bologna, submitted to the Surgical Society of Paris a case of necrosis of the lower jaw, from the fumes of phosphorus, in a man aged fifty-six years, in which the sequestra were removed through the mouth. M. Rizzoli made incisions on either side of the gums, scraped the thickened periosteum with a spatula from the dead bone, and removed the latter piecemeal. The preserved periosteum generated new bone in the place of the portions taken away, which comprised the body and part of the ramus on each side. It was, however, soon found that the upper part of the ramus and

the condyle were also diseased; these portions of bone were also removed through the mouth with the same precautions, and the periosteum again acted in the same way. Eventually the man was able to use his jaw, and masticate, though deprived of teeth. M. Forget, who reported on the case, observed very justly that there was nothing new in this action of the periosteum in necrosis of bone, surgeons having long acted upon this periosteal property in such cases. M. Flourens had pointedly said, 'Take away the bone, preserve the periosteum, and the preserved periosteum will restore the bone; but this applies less to cases of necrosis of bone than to cases of experiments on animals and operations performed on healthy bone and periosteum. And even in these cases it should be remembered that osseus substance is reproduced, but not the actual bone as it existed before the resection.' In some cases, however, incisions have been made at a comparatively early stage, before the shell of new bone has been formed, and the sequestrum immediately extracted, with good results. It may be doubted, however, whether there is any real gain in such procedures, either in time or result, since the repair is no more rapid that if the sequestrum were left, and there is the additional risk both of the actual operation, and of the deformity which may result from the premature withdrawal of the sequestrum. A case from the practice of M. Maisonneuve, illustrating the practice in the lower jaw, will be found in *Comptes Rendus*, April, 1861. In his recently-published work, 'La Régénération des Os,' M. Ollier, of Lyons, gives two cases of sub-periosteal resection, one of the upper and one of the lower jaw, for necrosis, in neither of which was there any osseous development, and which cannot, therefore, be regarded as very satisfactory examples of a proceeding whose great aim is the development of new bone."

Some practical remarks on the difference between bony cysts and cysts in bone are worthy of quotation. The first two sentences are from Mr. Adam's description of Mr. Cusack's well known case.

"The portion of bone removed comprises the entire right half of the lower jaw. The horizontal ramus is expanded into an oblong hollow shell with bony walls, and its interior is subdivided into many cells of various sizes, which are all lined by a fine polished membrane, and communicate freely with each other.

"Cases of this kind are to be distinguished from examples of cystic osteo-sarcoma, which will be subsequently described. Although the contents of the cysts may vary considerably, and may occasionally be so dense as to be almost solid, they are still *contents* only, and the cysts surround them, whereas in the case of cystic sarcoma a growth springs from the jaw, in which cysts of various sizes may be developed. The distinction is important, both on account of prognosis and treatment. In the cases of

cysts, whether uni- or multi-locular, the disease is of slow growth, and there is no tendency to fungous excrescences, so that the patient suffers little inconvenience. In the fibro-cystic growths, on the contrary, the progress is comparatively rapid, and the patient is soon worn out with pain and discomfort. The treatment of the two affections also is entirely different."

In the following page we find the following critical appreciation of two different operations:—

"Mr. Butcher, of Dublin, has for some years treated cases of cyst of the lower jaw through the mouth, by dividing the mucous membrane over the cyst freely, and then with gouge and bone-forceps removing the expanded external plate of the bone, with the contents and lining membrane of the cyst. In this operation, the teeth are interfered with as little as possible, and appear to remain firm. Granulations rapidly spring up from the denuded bone, and fill the wound made in the mouth; the cheek resumes its ordinary appearance, and no deformity or scar is left. In his work on 'Operative and Conservative Surgery,' Mr. Butcher narrates three cases treated in this manner, and remarks, that 'the proceeding according to this plan is troublesome and difficult, but its value to the patient in having no deformity left is priceless.' A valuable caution is here given respecting the facial artery, which might, without care, be divided from within the mouth in a position where it would be difficult to secure it. Mr. Butcher also narrates and gives a drawing of a case in which, finding the disease too extensive to be treated from the mouth, he adopted Dupuytren's external incision, and then levelled the projection to the line of the healthy bone with the best results, the incision being completely hidden behind the bone.

"Dr. Mason Warren has recently (*Boston Medical and Surgical Journal*, 1866) written upon the treatment of cysts of the jaws, and strongly recommends a milder and even more conservative practice than that followed by Mr. Butcher, which he thus summarizes:—'The treatment consisted in the puncture of the sac within the mouth, evacuating its contents, and at the same time obliterating its cavity by crushing in its walls; and lastly, in keeping up, by injections, &c., a sufficient degree of irritation to favour the deposition of new bone.

"One of Dr. Warren's illustrative cases will be found in the Appendix (Case XVII.), which contrasts favourably with the more severe operation of Mr. Butcher, and still more with cases treated by excision of the portion of the jaw containing the cyst."

We shall only draw attention to another portion of this essay, where Esmarch's operation for forming a false joint in cases of closure of the jaws by cicatricial tissue is compared with

Dieffenbach's—a subject on which several papers, by Mr. Heath, have appeared in this Journal. The passage is too long for insertion, and those who wish to read it must have recourse to the volume itself. We can promise them that they will find the book full of material and easyof digestion. It is capitally written in good English, without verbiage, andit is got up in Mr Churchill's usually good style. No operating surgeon should be without it.

Outlines of Physiology, Human and Comparative. By JOHN MARSHALL, F.R.S.; Professor of Surgery in University College, London; Surgeon to the University College Hospital. Two volumes. London: Longmans, Green, and Co. 1867.

IN the preface of the work which forms the subject of this notice the author states that the plan was designed with a special view to its utility as an educational book. It is not, therefore, a treatise merely embodying original investigations in a particular branch of science. Its perusal amply justifies the author's expectations that the concise but comprehensive summary of modern physiological science, both human and comparative, here presented, will prove as useful and interesting to the student of medicine and surgery, as it must form a convenient guide and an ample store of information to the lovers of nature generally in the prosecution of their physiological studies. With such aims in view physiology is treated of in connexion with those sciences—anatomy, chemistry, and physics—on which to so large an extent it must depend. It is impossible fitly to appreciate those treasures, which Nature strews with such profusion in our path, without a good working knowledge of chemistry and natural philosophy; such knowledge is absolutely needful to prosecute our inquiries successfully—just as needful as is the general mental culture which ought to preside over, and precede, all professional study. In the fulfilment of a task which must have involved immense labour and patient research, the author has taken care to avail himself of the most recent inquiries of the authorities on every subject with which he deals.

Two goodly volumes, with upwards of 600 pages in each, are occupied, firstly, as forming the groundwork of biological science, with a brief but sufficient description of the structures of the human body, their different characters and uses. The concluding portions of the first volume treat of general physiology, including

the functions of the living organism, and the vital properties of the tissues; the relations of man with external nature, a comparison of the animal and vegetable kingdoms, and of both with inorganic nature. The volume concludes with an elaborate examination of the functions of animal life. The functions of vegetative life occupy the larger portion of the second volume. Animal statics and dynamics, comprising the various forms of force exerted by the living body, with the relations of these forces to the quantity of food and air consumed, are considered in a separate section. The subject is one of the utmost importance, and is most ably treated by the author, who avails himself of the investigations of Professors Haughton, Playfair, Frankland, and Parkes, and indeed of all recent inquirers, to supplement his own. The different forms of reproduction in the animal kingdom, with the development of the vertebrate embryo are very fully discussed, and a short account of the growth, decay, and death of the body terminates the second volume. The plan of the work is both simple and convenient, and the whole is wound up by a most excellent index.

An admirable feature in the work is the excellence of the illustrations, more especially those derived from the structure and functions of the inferior animals, as bearing on those of man. This is of the more importance when the book is considered with reference to general education. It is difficult to assign a limit to the knowledge of both structure and function, which may in this way be achieved. It is important both as regards the study of the human frame, and it is important in regard to the inferior races, themselves so eminently deserving of separate, as well as comparative study and consideration.

The great range, not to dwell on their vast importance, of the subjects discussed in this work would render it impossible, within any reasonable compass, to comment severally upon the author's views. Still, it may not be inexpedient to advert to one or two points before closing the volumes, and commending them to the favour their merits are so well calculated to secure. Under the head of Chemical Composition of the Tissues, bone is stated to contain 10, muscular tissue about 74, blood 80, and grey nervous matter as much as 85 per cent. of water. The animal frame, however, when carefully dried, or casually mummified, has been found to lose so largely in weight that Moleschott's estimate, that in the entire human body water forms about 68 parts out of every 100, will probably be ascertained to be an inadequate proportion to cite as the actual fluid contents of the tissues. The circumstance is not of so much importance in

itself, as illustrating one of nature's provisions for economizing the supply of solid ingredients. Tissue, or essential water, as the author terms it, is perhaps the most important constituent of the human body. Without an ample supply, the unceasing vital and chemical actions which go on must come to an end. And, as Mr. Marshall insists, there is much reason to suppose that the action of water in the body is not that of a mere solvent, but that it enters into true chemical combinations during the varying vital processes of integration and disintegration. We know of nothing whose protracted loss entails such painful suffering as the want of water, a fact which, of itself, would fairly justify the inference as to its immense importance in the animal economy. The author's remarks on respiration are full and interesting, as well as suggestive of many reflections. His expression of parenchymatous respiration is a very happy one.

Marshall's *Outlines of Physiology* throughout, brings the reader to the level of the most recent investigations. It is a work of vast labour, evinces in many respects the utmost ability and painstaking research, and will doubtless long remain a worthy monument of the writer's fame.

Short Notes on Nice. By JAMES STANNUS HUGHES, M.D., F.R.C.S.I.; Prof. of Surgery in the Royal College of Surgeons, Ireland; Surgeon to Jervis-street Hospital, &c. Dublin: Cooper. Fcp, 8vo, pp. 37.

IN the winter of 1867 Dr. Hughes visited Nice, and was so much pleased with it as a winter residence for patients suffering from certain forms of disease, and, at the same time, so struck with its unsuitability for many who are often sent there, that he determined to collect all the information he could as to its climate and its peculiarities as a Health Resort, and lay it before his professional brethren in a concise and convenient form. The *brochure* before us owes its origin to this determination. The climate of Nice is of a stimulating character; and Dr. Hughes shows that while it is very beneficial in certain forms of phthisis, in chronic bronchitis, atonic dyspepsia, albuminuria, and many allied forms of disease, it is injurious in advanced cases of phthisis, especially where there is a quick pulse, with irritative fever, in irritative dyspepsia, and many similar cases. It appears, moreover, that the different dis-

tricts of the town present peculiar features, making them suitable for different forms of disease, so that patients going there should be warned as so the residences they select. On this subject Dr. Hughes gives much valuable information, and also on the means of getting to Nice, the route to be taken, and the expense of the journey, as well as the cost of living when there. We think Dr. Hughes has conferred a great benefit on his professional brethren by laying before them, so clearly and minutely, and, at the same time, so briefly, the results of the observations he made during his visit to Nice.

Clinical Lectures on Diseases of the Liver, Jaundice, and Abdominal Dropsy. By CHARLES MURCHISON, M.D., F.R.S., &c. London: Longmans, Green, and Co. 1868. Post 8vo, pp. 556.

WE always see with pleasure any communication from Dr. Murchison; before he publishes he takes the trouble of making himself acquainted with what others have written on the subject, and he waits till he has collected, as the result of personal observation, ample materials not merely to justify but to give weight to an independent judgment. In the work before us he has not departed from his usual custom; it bears evidence of an accurate and extensive knowledge of the researches of others, and of laborious and careful investigation on his own part.

The first lecture is devoted to a description, illustrated by diagrams, of the normal situation and dimensions of the liver, and of the various conditions which are liable so to alter its position as to give an appearance of enlargement, such as congenital malformations, rickets, tight-lacing, and diseases of the thoracic and abdominal cavities. The second and third chapters treat of true enlargements of the liver, and of these he makes a division, very suitable for clinical purposes, into the painless and the painful enlargements. Dismissing very briefly that rare condition known as simple hypertrophy, in which there is increased size and number of the secreting cells without alteration in structure, he gives a clear and admirable account of the three other painless enlargements—those, namely, which arise from waxy deposit, from accumulation of oily matter, and from hydatid tumour. Of those in which pain is a prominent symptom he enumerates six:—congestion of the liver, inflammation of the bile-ducts, obstruction of the common

duct and retention of bile, pyemic abscesses, tropical abscess, cancer. Speaking of congestion he gives a warning of the necessity of which our own experience has several times convinced us. In diseases of the heart the moderate use of brandy and whiskey often gives relief which no other remedy affords, but the regulation of the quantity requires the greatest care; the liver, already loaded with blood owing to the obstacle to its onward flow presented by the cardiac mischief, is very liable to become painfully congested by the irritation of alcoholic drinks. Some time ago we were summoned during the night to see a sufferer from aortic and mitral disease, the immediate cause of whose misery was plainly congestion of the liver, brought on by the reckless use of stimulants without medical advice, a few grains of calomel laid on his tongue, and two leeches applied to the margin of the right ribs, gave an amount of relief which created in his mind an estimate of the curative resources of his adviser, which, unfortunately, the nature of his permanent malady did not justify. Though abscess of the liver is a rare disease in this country, it yet occurs with sufficient frequency, and when it does occur the determination of what is to be done with it is a matter of such anxiety to the physician that we quote Dr. Murchison's opinion on the subject, adding that circumstances having imposed on us the responsibility of treating six such cases, the result of waiting was in every one of them just what he says. In one the abscess burst into the peritoneal sac and caused death with extreme suffering; in one life was destroyed without rupture by prolonged diarrhea and pressure on the right lung; in one, an hospital patient, a woman who had never been out of Britain, fever, vomiting, and diarrhea brought about the fatal issue. In the fourth, the abscess emptied itself through the right lung, and although the gentleman had every advantage of change of air and nourishment he was gradually worn down. In the remaining two openings took place both into the right lung and externally, with a like result. He says:—

"After duly balancing, then, the dangers of operation against the dangers of expectancy, I do not hesitate to recommend to you the propriety of evacuating the pus in a large number of cases of tropical abscess of the liver. The operation may not be free from danger, but to wait in these cases upon Nature, as it is called, is to wait upon Death, and I would suggest for your guidance the following rules:—

"*a.* In all cases where there is a visible fluctuating tumour, operate at once.

"*b.* In cases where the symptoms of abscess of the liver are present, with a distinct tumour projecting from the normal contour of the liver or causing bulging of the ribs, even though there be no perceptible fluctuation, it will be well to operate.

"*c.* When symptoms of abscess coexist with uniform enlargement of the liver, but with no distinct tumour or bulging, if there be any local œdema, or obliteration of an intercostal space, or acute pain, always localized to one particular spot when the patient takes a full inspiration, it will be well to operate; but if there be no such œdema or obliteration or pain, it may be better to wait, as the enlargement may possibly be due to multiple abscesses, or if there be but one abscess, it is doubtful if it will be reached.

"When the operation is resolved on, it may be performed as follows:—

"*a.* When there is distinct pointing with an inflammatory blush of the skin, an opening may be made with a bistoury.

"*b.* Under other circumstances, a small trocar will be preferable, and it ought to be introduced wherever there is the slightest fulness or superficial œdema, or acute pain.

"*c.* When the abscess is small, not holding more than ten or twelve ounces, it ought to be completely evacuated, and the canula tied in for two or three days. On its removal, a tent of lint dipped in oil may be substituted.

"*d.* When the abscess is very large it will be better to evacuate it by instalments at short intervals, carefully excluding the air on each occasion.

"*e.* In the exceptional cases, where no adhesions exist, it will be prudent to produce them by the local application of caustic potash, before puncturing.

"*f.* After the operation, a large warm poultice should be applied over the liver, and the patient should lie on it, taking care that, if the canula has been left in, pressure upon it is obviated by a suitable pad or pillow. A full dose of morphia ought also to be administered at once."

The author next treats of cancer at length, and very briefly of the rare forms of hepatic enlargement due to tubercular deposit, disease of the lymphatic system and multilocular hydatid tumour, and then proceeds to contractions of the liver. He shows that there are five perfectly distinct pathological conditions under which a chronic atrophy of the organ is found, though, doubtless, they are all commonly set down as cirrhosis. We sometimes hear great surprise expressed at the discovery of a contracted liver in a person of temperate habits, the supposition being that increase in the amount of

fibrous tissue and destruction of the secreting structure (true cirrhosis) is the only way in which hepatic atrophy can result; this, Dr. Murchison believes, occurs, with hardly an exception, in those only who have drank ardent spirits freely and in an undiluted form. Obstructed circulation in pulmonary and cardiac disease, however, is liable to cause such distention of the capillaries of the hepatic vein that they obliterate by their pressure the secreting cells, and thus lead to diminution in the bulk of the organ. In those who have been temperate, too, there is sometimes seen an atrophic condition, in which there is no increase in the fibrous tissue though in other respects it presents an aspect closely resembling true cirrhosis. Frequent attacks of peri-hepatitis are likewise liable to leave the capsule thickened and dense bands of fibrous tissue stretching into the interior; this state, to which the syphilitic appear specially liable, ends in lessened size of the liver; and lastly, there is the "chronic atrophy" of Frerichs, or the "red atrophy" of Rokitansky, of which destruction of the ramifications of the portal vein is the important anatomical character, and which is most frequently seen in connexion with simple and cancerous ulceration of the stomach and bowels. During life it is difficult, and fortunately not very important, to distinguish between these several forms of atrophy, but Dr. Murchison gives us some hints which will in many cases guide us in doing so.

The eighth, ninth, and tenth chapters, occupying one hundred and fifty pages, are devoted to the important subject of jaundice. He points out the various causes which may give rise to a colour of the surface more or less resembling it and liable to be mistaken for it, and tells us how we may distinguish them from it. He describes the phenomena and symptoms of true jaundice, and then discusses the theory of its production. All cases of jaundice, he tells us, may be referred to one of two classes:—

I. Cases in which there is a mechanical impediment to the flow of bile into the duodenum, and where the bile is in consequence retained in the biliary passages and thence absorbed into the blood.

II. Cases in which there is no impediment to the flow of bile from the liver.

The way in which jaundice arises in the first class is sufficiently clear. To explain the cases in the second the theory of non-secretion has usually been adopted. It is assumed that bile, or at all events, bile pigment, exists ready formed in the blood, and that if the liver fails to separate it, an accumulation of it in the circulating

fluid is the result. From this view Dr. Murchison altogether dissents, and he gives what appear to us valid reasons for doing so. He believes that the bile-pigment is formed in and by the secreting structure of the liver, and does not exist in the blood before it reaches that organ. The phenomenon of jaundice, where there is no obstruction to the escape of bile through the ducts, he then proceeds to account for as follows:—

"There are grounds for believing that not only in jaundice, but in health, a portion of the bile-pigment, as well as of the bile-acids formed in the liver, is absorbed into the blood.

"The quantity of bile-pigment discharged with the feces is but a fraction of what is calculated to be secreted by the liver. Speaking of the principal constituents of bile, Dr. Carpenter remarks: 'the further we descend in the intestinal canal, the less of them do we meet with:' and again he says: 'of the bile which is poured into the alimentary canal, a large part is certainly reabsorbed, its constituents being destined to undergo oxydation and be eliminated, for the most part by the respiratory processes; and it is probably from this reabsorbed portion of the bile that the sulphur of the urine is derived.' According to Dr. Bence Jones, also, 'the colouring matter (of the bile) undergoes changes in the intestines, and some of it most probably in health is carried into the blood and textures, and is finally removed in the colouring matter of the urine. It is the knowledge of this circumstance that offers the only satisfactory explanation of the remarkable discrepancy of opinion in the profession respecting mercury, podophyllin, and other substances which are supposed to exercise some specific effect upon the liver, in stimulating it to an increased secretion of bile. The practical physician gives a dose of calomel, finds the quantity of bile in the motions greatly increased, and argues that the liver has been stimulated to an increased secretion; but the physiologist ties the common bile-duct, makes a fistulous opening into the gall-bladder, and then finds that calomel has no effect on, or even diminishes, the amount of bile that drains away through the fistula. Mercury and allied purgatives probably produce bilious stools by irritating the upper part of the bowel, and sweeping on the bile before there is time for its absorption; irritating articles of diet will often produce precisely the same effect. Calomel is of unquestioned utility in congestion of liver, but if it acted, as is usually argued, by stimulating the liver to increased secretion, it might be expected to increase the congestion rather than diminish it. It is quite possible, however, that the irritation of the duodenum by purgatives may be reflected to the gall-bladder, and cause it to contract, and that the evacuation of this viscus may account in part for the increased quantity of bile in the stools.

"2. Although in the human subject, if there be no obstruction of the

common bile-duct, sufficient pigment remains to colour the feces, in carnivorous animals the feces contain scarcely any pigment, and in the boa, although the liver is large and secretes bile freely, the excrement contains no trace of pigment. The bile-pigment in these animals disappears for the most part or entirely in the bowel, and yet these animals are not jaundiced.

"3. From what is now known of the diffusibility of fluids through animal membranes, it is impossible to conceive bile long in contact with the lining membrane of the gall-bladder, bile-ducts, and intestine, without a portion of it (including the dissolved pigment) passing into the blood. A circulation is constantly taking place between the fluid contents of the bowel and the blood, the existence of which, till within the last few years, was quite unknown, and which even now is too little heeded. 'It is now known,' says Dr. Parkes, in his Gulstonian Lectures on Pyrexia, 'that in varying degrees, there is a constant transit of fluid from the blood into the alimentary canal, and as rapid reabsorption. The amount thus poured out and absorbed in twenty-four hours is almost incredible, and of itself constitutes a secondary or intermediate circulation never dreamt of by Harvey. The amount of gastric juice alone, passing into the stomach in a day, and then reabsorbed, amounted in the case lately examined by Grunewald, to nearly 23 imperial pints. If we put it at 12 pints we shall certainly be within the mark. The pancreas, according to Kroeger, furnishes $12\frac{1}{2}$ pints in twenty-four hours, while the salivary glands pour out at least 3 pints in the same time. The amount of the bile is probably over 2 pints. The amount given out by the intestinal mucous membrane cannot be guessed at, but must be enormous. Altogether the amount of fluid effused into the alimentary canal in twenty-four hours amounts to much more than the whole amount of blood in the body; in other words, every portion of the blood may, and possibly does, pass several times into the alimentary canal in twenty-four hours. The effect of this continual outpouring is supposed to be to aid metamorphosis; the same substance more or less changed seems to be thrown out and reabsorbed until it be adapted for the repair of tissue or become effete.

"It is in the course of this osmotic circulation that the constituents of bile are taken up into the blood, becoming themselves probably transformed in the process into products which are eliminated by the lungs and kidneys,[a] while at the same time they assist in the assimilation of the nutritive materials derived from the food. And here we have an explanation of those cases of jaundice where there is no impediment to the flow of bile from the liver. Under normal conditions, the bile that is

[a] In various diseased conditions of the liver, even when there is no jaundice, or bile-pigment in the urine, this fluid is rendered very dark, sometimes almost black, by boiling and adding nitric acid.

absorbed is at once transformed, so that neither bile-acids nor bile-pigment can be discovered in the blood, and there is no jaundice. But in certain morbid states the absorbed bile does not undergo the normal metamorphoses, but circulates with the blood and stains the skin and other tissues. The morbid states, which, so far as we know, conduce mainly to this result, are these:—

"1. Certain poisons, such as snake-poison and chloroform, the poisons of yellow fever, relapsing fever, pyemia, or in rarer cases, those of remittent fever, typhus, scarlatina, &c.

"2. Nervous influences, such as a sudden fright, great or protracted anxiety, &c.

"3. A deficient supply of oxygen, as in persons living in confined and crowded dwellings, may prevent the normal metamorphoses of bile taking place.

"4. An excessive secretion of bile, especially when conjoined with constipation. In this case, unless the bile be removed by the bowels, too much may be absorbed to undergo the normal metamorphoses, and the presence of the untransformed bile in the blood causes jaundice.

"The only difference, then, between jaundice from obstruction and jaundice independent of obstruction of the common bile-duct, is that in the former case none of the bile can escape from the body by the feces, and consequently all that is secreted, after the gall-bladder and biliary passages are fully distended, must be absorbed into the blood. As might be expected, the jaundice in this form is usually much more intense than in the other, although even here the intensity will vary according to the amount of bile secreted by the liver, and the activity of the metamorphoses going on in the blood. When the obstruction has lasted long, the jaundice often becomes much paler, not from removal of the obstruction, but from the secreting tissue of the liver being destroyed and comparatively little bile being secreted.

"Lastly, we may inquire what explanation the theory of jaundice now advanced gives of the cerebral symptoms met with in certain cases and already referred to (p. 296). From what has been stated it is very probable that the entrance of bile into the blood is necessary to perfect those metamorphoses from which materials for the urinary solids are derived. At all events, this seems certain that when the secreting tissue of the liver is destroyed, as in acute atrophy and in certain cases of long-standing obstruction of the bile-duct, these metamorphoses are imperfectly executed. Urea is not formed in sufficient quantity, and substances such as leucine and tyrosine, of intermediate composition between it and the proteine compounds (see p. 230), accumulate in the blood and appear in the urine. These are the circumstances under which cerebral symptoms occur in cases of so-called 'suppression of bile.' The mere presence of bile in the blood, as I have already shown you (p. 297), will not

account for them, and indeed in those cases where cerebral symptoms are most apt to supervene, the jaundice as a rule is less intense than it often is when they are absent."

Discrediting, therefore, the existence of either bile-pigment or bile acids in the blood before it reaches the liver, believing, in fact, that bile must have been formed by the liver in every case before it can be present in the blood, Dr. Murchison is not disposed to attach any importance to the modification of Pettenkofer's test, on which stress was laid by Dr. Harley in his *Essay on Jaundice*, as serving to distinguish cases of retention from cases of suppression of bile. He enumerates and discusses in detail, but concisely, the numerous causes of jaundice, and then carefully sums up the elements of diagnosis:—

"1. The chief indication of obstruction of the common bile-duct is furnished by the stools. When there is no obstruction of the duct, the stools almost invariably contain a certain quantity of bile; but when the duct is obstructed, no bile enters the bowel, and the stools are clay-coloured. Two sources of fallacy must be remembered. First, the jaundice usually persists for a short time after the removal of the obstruction, and thus, as happens not unfrequently in the case of gall-stones, bilious motions may coexist with jaundice which has resulted from obstructed bile-ducts. Secondly, if the motions be thin or watery, they may appear to contain bile from the admixture of jaundiced urine.

"2. A tumour corresponding to the region of the gall-bladder will favour the view that the jaundice is due to obstruction of the bile-duc (p. 142).

"3. Jaundice which persists, and is yet slight, is most probably independent of obstruction of the bile-duct. Persistent jaundice from obstruction speedily becomes intense; but in reference to this you must remember what I have so often insisted upon, that even when there is irremovable obstruction of the bile-duct, the intensity of the jaundice will vary from time to time according to the amount of bile secreted by the liver, and that in the advanced stage the jaundice may permanently fade in consequence of the destruction of the glandular tissue and the small quantity of bile which is secreted.

"4. Jaundice appearing suddenly in a person whose previous health has been good is most probably the result of obstruction of the duct by a foreign body, or it has a nervous origin. In the former case it will be preceded or accompanied by biliary colic and vomiting, and the stools will be clay-coloured: in the latter there will be a history of concussion or of some severe mental emotion, the motions will contain bile, and the jaundice will be often accompanied by delirium and other cerebral symptoms.

"5. Jaundice coming on very slowly, but ultimately becoming intense, with complete disappearance of bile from the motions, is most probably the result of pressure on the bile-duct from without, or of the growth of some tumour in the interior of the duct (pp. 337-9).

"6. Several attacks of temporary jaundice with distinct intermissions point to gall-stones if the patient be of adult or advanced life (p. 322); early life, to catarrh of the duodenum or bile-ducts (p. 133).

"7. Pain is present in some cases of jaundice, absent in others. There may be little or no pain in cases where the cause is a duodenal ulcer, a simple stricture of the duct, enlarged glands in the fissure of the liver, or the poison of some specific fever. It is well also to remember that in very rare cases a gall-stone has been known to obstruct the common duct and cause permanent jaundice, without ever having excited attacks of biliary colic. A pain coming on in severe paroxysms, and then subsiding, may result from: *a*, gall-stones (see p. 319); *b*, hydatids (p. 325); *c*, a duodenal ulcer (p. 334); and, *d*, an aneurism of the hepatic artery (p. 345). Pain, more or less constant, with tenderness on pressure below the right ribs, will indicate that the jaundice depends on: *a*, congestion of the liver (p. 121); *b*, catarrh of the bile-ducts (p. 132); *c*, pyemia with purulent deposits in the liver (p. 148); *d*, cancer of the liver (p. 190); *e*, acute atrophy of the liver (p. 227).

"8. Jaundice concurring with great enlargement of the liver is most probably due to cancer of the liver (p. 190); but it may also arise from waxy liver, when the bile duct is compressed by enlarged glands in the portal fissure (p. 26), or from multiple abscesses of the liver (pp. 147, 460).

"9. The diagnosis of the cause of jaundice is often materially assisted by the coexistence with it of ascites. When permanent jaundice, with complete absence of bile from the motions, and ascites without dropsy elsewhere are present in the same case, you will rarely be wrong in inferring that the obstruction of the gall-duct, which causes the jaundice, and the obstruction of the portal vein, from which the ascites results, are due to a common cause. That cause cannot be a gall-stone. This will obstruct the bile-duct, but cannot obstruct the flow of blood in the portal vein, so as to produce ascites. The double obstruction is most likely to be caused by pressure from without upon the gall-duct and portal vein, where they lie side by side in the fissure of the liver, by enlarged lymphatic glands, by a tumour in the head of the pancreas, or by cancerous nodules projecting from the surface of the liver itself. It is quite possible, however, for these lesions to cause jaundice, without ascites. In the advanced stage of cirrhosis it is also not uncommon for jaundice to coexist with ascites; but then the liver is small, the jaundice is slight—little more than sallowness, and, what is more important, the colour of the motions proves that bile-pigment is still secreted, and finds its way into

the bowel. There is not a complete absence of bile-pigment from the excrement.

"10. In a large proportion of cases of jaundice the pulse is unusually slow and the temperature is not increased. When jaundice is accompanied by febrile symptoms, the probable causes are: *a*, inflammation of the bile-ducts (p. 132); *b*, some specific fever (p. 378); or, *c*, pyemia (pp. 148, 390).

"11. Delirium, stupor, and other cerebral symptoms concurring with jaundice suggest: *a*, acute atrophy of the liver (pp. 228, 395); *b*, poisoning by phosphorus (p. 393); *c*, some specific fever or other blood-poison (p. 378); *d*, nervous shock (p. 398); or *e*, pneumonia (p. 401). In all these cases the symptoms are those of an acute illness, the stools contain bile, and the urine often contains leucine and tyrosine and is deficient in urea. Similar symptoms, however, may also supervene in cases of protracted jaundice from obstruction of the bile-duct, in which the stools contain no bile (p. 296).

"12. In diagnosing the cause of jaundice it is always important to keep in view the condition of the patient prior to its appearance. In the case of jaundice from gall-stones or nervous shock the patient may have been in excellent health previously. In catarrhal jaundice the attack is preceded for a week or ten days by febrile symptoms with vomiting and diarrhea (p. 132). Great emaciation with vomiting after food prior to the jaundice ought to suggest cancer of the pancreas, duodenum, or pylorus (pp. 337, 342), and pain two or three hours after a meal with hematemesis will point to a duodenal ulcer (p. 333). Jaundice occurring in the course of specific fevers or pyemia will be preceded by the symptoms characteristic of these disorders. Jaundice in the early stage of pregnancy may be due to congestion of the liver from suppression of the catamenia (p. 125); in the more advanced stages it may arise from pressure of the enlarged uterus upon the bile-duct (p. 348), or from acute atrophy (p. 232). Lastly, true jaundice in the new-born child may result from the inhalation of a vitiated atmosphere (p. 401), from plugging of the bile-duct by inspissated bile or gall-stones (p. 323), or from congenital closure or deficiency of the duct (p. 329)."

The eleventh chapter is devoted to a consideration of the means of detecting fluid in the peritoneum, the various conditions which simulate it, and the different causes on which it may depend; and the twelfth to a separate discussion of the three subjects of hepatic pain, gall stones, and enlargements of the gall bladder. The whole work admirably sustains Dr. Murchison's reputation as a teacher of exact diagnosis, an earnest searcher after a true pathology, and a practical physician. The chapters on treatment contain most

valuable directions as to the management of such cases of hepatic disease as are curable, and suggestions for relieving the distressing symptoms in the many which unfortunately are not.

CARMICHAEL PRIZE ESSAYS.

1. *First Carmichael Prize Essay:—The Medical Profession and its Educational Licensing Bodies.* By E. D. Mapother, M.D., Professor of Anatomy Royal College of Surgeons, &c. Dublin: Fannin and Co. 1868. Fcp. 8vo, pp. 227.

2. *Medical Education and Medical Interests*, being the Essay to which was awarded the Carmichael Prize of £100 by the Council of the Royal College of Surgeons in Ireland, 1868. By Isaac Ashe, A.B., M.B., C.M., T.C.D. Dublin: Fannin and Co. 1868. Fcp. 8vo, pp. 164.

In his will, dated the 11th February, 1849, the late Richard Carmichael bequeathed £3,000 to the College of Surgeons in Ireland, for the institution of two prizes of £200 and £100 each, to be adjudged every fourth year by the Council of the College, for the best and second best essays on the following subjects:—

1st. "The state of the Medical Profession in its different departments of Physic, Surgery, and Pharmacy in Great Britain and Ireland at the time of the writing of these essays."

2nd. "The state of the Hospitals and Schools of Medicine, Surgery, and Pharmacy."

3rd. "The state and mode of examination of testing the qualifications of candidates of the different licensing Colleges or Corporations in Medicine, Surgery, and Pharmacy."

Mr. Carmichael directed further that under these heads the authors should make suggestions as to the improvement of the profession, so as to render it more useful to the public and a more respectable body. That they should consider the preliminary and moral education of students and the best mode of conducting their medical studies, and also the best mode of rendering the examinations as demonstrative as possible.

Mr. Carmichael desired that in case the Council of the College did not carry out the bequest the interest of the money should be handed over to the Medical Benevolent Fund; and, whether owing to a desire to have the money thus applied or to the difficulty of

obtaining essays of sufficient merit, the prizes have never been awarded till now, very nearly twenty years after the death of the founder. It is not, however, our province to inquire into this, but there seems to be good reason to believe that the Council thought the money would be more usefully applied to the purposes of the Medical Benevolent Fund than to the institution of prizes.

Of the essays to which the prizes have at length been awarded, that of Dr. Mapother obtained the first and Dr. Ashe's the second. We do not mean to question the correctness of the decision, nor to compare the merits of the essays. They are both well written and full of most interesting and valuable information, well digested and arranged; and though we may differ in many points from both authors, yet we can honestly congratulate them on their success, and the profession on the exposition afforded of its wants, and the suggestions made for its improvement.

Dr. Mapother has given more attention to the first and second clauses specified by Mr. Carmichael—that is, the state of the profession and of the hospitals and schools—than Dr. Ashe, who has mainly devoted himself to the educational aspects of the question. Dr. Mapother opens his essay by showing that medicine has for its field not merely the curing of the sick but the preservation of the health both of individuals and communities, and that it affords besides valuable aid in relation to many subjects of vital interest to the State. The members of the profession have, moreover, been distinguished in all ages for their scholarly and scientific pre-eminence, as well as for their unselfish and philanthropic exertions, and for a forgetfulness of personal danger which, while it may not equal the brilliancy of military heroism, surpasses it in usefulness. The importance of the profession is not, however, fully recognized, and Dr. Mapother refers to many examples showing the want of generosity of governments towards it, and he suggests as remedies the more thorough education of the public, so that they may know how to distinguish between ignorant pretenders and well-informed and honourable practitioners, who will offer neither flattery nor false hopes; the institution of just rewards, such as elevated positions in the State for its most distinguished promoters, which would stimulate the talented and refined to adopt it as their calling; and he urges its claims to parliamentary representation.

The history of the legislative enactments affecting the medical profession is rapidly sketched by Dr. Mapother from the first charter down to the Act of 1858, of which he gives an analysis

offering some suggestions for its amendment. He then describes the conditions necessary to ensure success in medical life. Medical ethics, and the conditions of the various services, both military and civil, are next considered, and it is shown that the condition of the so-called "State medicine" is at present very unsatisfactory as regards registration, sanitary and medico-legal arrangements, and the appointment of "medical supervisors," is suggested to whom the superintendence of registration should be transferred from the clerks of unions, and also the non-legal functions of coroners, the legal being committed to the stipendiary magistrates and police, and these functionaries abolished.

As to private practitioners, Dr. Mapother argues that there should be two grades—viz., the Physician and Surgeon who does not supply medicines to his patients, and the General Practitioner who does; and these latter, he urges, should only charge for their advice and attendance, and have nothing to do with the sale of drugs, which should be confined entirely to Pharmaciens, or the licensees of a College of Pharmacy, a title proposed to be conferred on the Apothecaries' Hall of Ireland and the Parmaceutical Society of England. Pharmaciens should, on the other hand, be forbidden to embark in medical practice. Dr. Ashe holds even more decided views as to the complete severance of pharmacy from medical practice, for he would have the General Practitioner decline, in all cases where it may be possible, to supply medicines to his patients, even gratuitously, and he states that this has now become the general rule in Liverpool. He argues that the combination of trade in drugs with the profession of medicine is not only incompatible with the due performance of the duties of both, but derogatory to the profession and injurious to the public.

We now come to the consideration of education. On this subject Dr. Ashe enters more into detail than Dr. Mapother. As to preliminary education, he proposes that it should begin at the age of twelve, and continue till eighteen, and be conducted in special schools under the management of physicians. He lays down a curriculum indicating the subjects to be studied in each of the six years. At the end of this time he would allow the strictly professional education to commence; but an examination in the subjects studied at school must first be passed, and Dr. Ashe would not allow any exemption from this examination, not even to graduates in arts, for many young men, he says, obtain degrees in arts without having gained any such amount of knowledge, or

given any such proof of education or cultivation of mind as should imply the possession of even very humble abilities—abilities which would fall far short of the standard required for the due discharge of the duties of our profession.

Dr. Mapother is far from being so definite in his directions as to the preliminary education; but he too wishes for a special school for lads intended for the medical profession, and his views are in the main of the same character as those of Dr. Ashe. They both seem to us to have committed a not uncommon error in aiming too much at the acquisition of useful knowledge rather than at the education of the mind. Dr. Mapother thinks "unless students commence an arts course early it is not advisable they should spend four years at it, for these," he says, "are the very years when the mind is most capable of learning the practical duties and the kind of knowledge which make the good physician." Dr. Ashe also objects to University courses, "because the time and means necessary for the course of instruction are more than can be afforded by young men designed for the pursuit of medicine." Both authors, indeed, acknowledge the advantages that would arise from a University education, and the importance of the social *status* derived therefrom, but both seem to us to misapprehend the true object of preliminary education and the value of University training. This subject was very happily touched on by Professor Acland in his address to the British Medical Association at the late Oxford meeting; and the following quotation, which he made from Mr. Mill, clearly shows the true functions of a University:—"The proper function of a University in national education," says Mr. Mill, "is tolerably well understood. At least there is a tolerably general agreement about what a University is not. It is not a place of professional education. Universities are not intended to teach the knowledge required to fit men for some special mode of gaining their livelihood. Their object is not to make skilful lawyers or physicians, or engineers, but capable and cultivated human beings. . . What professional men should carry away with them from a University is not professional knowledge, but that which would direct the use of their professional knowledge, and bring the light of general culture to illuminate the technicalities of a special pursuit."

The narrowing tendency of exclusive devotion to one class of pursuits in a limited society, deprecated by Dr. Acland in his address, may be adduced as an insuperable objection to all special

systems of preliminary education, and we rejoice to know that in Ireland, at least, the number of students who seek the advantages of a University training before commencing their professional education is every year increasing. Already, indeed, a larger proportion of the medical men of Ireland possess degrees in arts than in any other part of the kingdom. We at one time made a careful analysis of Churchill's Medical Directory in reference to this subject, where we found that of the medical men practising in England 4·10 per cent. made returns showing they had degrees in arts, or degrees in medicine, which implied degrees in arts. In Scotland the proportion was 3·4 per cent., while in Ireland it was as high as 17·12 per cent.

We come now to consider professional education. On this Dr. Mapother makes but few suggestions. He describes the present arrangements of the schools, and seems to think them sufficient if well and thoroughly carried out. He would allow the student to commence his professional education at any age. Sixteen or seventeen he considers the normal age. He would provide collegiate residences for the students, and have them wear academic costumes. He considers four years a sufficient time for the professional education, and thinks any lengthening of it would be inadvisable. Hospital attendance should, he thinks, be continued throughout the whole course, as well as the study of practical anatomy; and in addition to attendance on the various lectures he would advocate an efficient system of tutorial instruction (grinding) throughout the whole period of the student's pupilage.

As with preliminary education so with the professional, Dr. Ashe is more definite and precise than Dr. Mapother. In many respects, indeed, he is arbitrary to a fault in his rules. His remarks arrange themselves under two heads—practical instruction and systematic; and he recommends plans for the more full development of both. Under the first head he dwells especially on the value of case-taking and dresserships, and urges the formation of classes for clinical tutorial instruction by the resident medical officers of hospitals. In reference to "systematic instruction," or that given in the school lecture-room in contradistinction to that given in the hospital, the dissecting-room, or the chemical laboratory, Dr. Ashe recommends free trade in teaching. He would "subject the lectures to those conditions of competition and rivalry which, and which alone, are proved by theory and shown by experience to be capable of stimulating and guiding exertion, and ensuring excellence in all

other walks of life, and this can only be done by making attendance on the class, payment of the fee, and production of the certificate optional on the part of the student." This is a system we have repeatedly advocated in the pages of this Journal, but we have always recommended that sessional examinations should be combined with it. We would let students obtain their education where, when, and how they please, but make the colleges test their progress by examinations on stated subjects three or four times in each year of their pupilage. Thus the colleges would be enabled to enforce a systematic course of training, and the benches of incompetent or indolent teachers would be emptied, while teachers having information to give and capable of giving it would find their reward. Dr. Ashe omits the sessional examinations from his programme, and we do not see how his system of free trade teaching could work without them; but combined with the sessional examinations it would, we believe, be the true remedy for the present deficiencies in our schools and systems of education; above all, it would put an end to all systems of cramming, and place on their true basis the systems of professorial and tutorial teaching. We have dwelt at such length upon what we consider the most important parts of those essays that we cannot refer to the remaining points discussed in them. We earnestly commend the careful study of the essays themselves to our legislators, and to those entrusted with the guidance of our colleges and the regulation of medical education, as well as to all who either are or are about to become students of medicine.

PART III.

MEDICAL MISCELLANY.

Reports, Retrospects, and Scientific Intelligence.

PROCEEDINGS OF THE PATHOLOGICAL SOCIETY OF DUBLIN.[a]

Dr. Gordon, President.

Purulent Inflammation of the Aorta.—Dr. Gordon said:—The preparation which I now lay before the Society presents some features of morbid anatomy worthy of record. The subject of the case had been attending the Whitworth Hospital as an intern patient, back and forward, for the last three years. The symptoms under which he laboured were very constant. He had always been admitted with bronchitis and emphysema of the lungs; and the condition of the heart was considered to be a very wide tricuspid opening allowing of regurgitation freely back from the right ventricle, and also a permanently patent condition of the left auriculo-ventricular opening. This opening was considered to be also rather widened than narrowed, on account of the fulness and freedom from intermission in the pulse, and other signs and symptoms. The attacks under which the man laboured almost always yielded to treatment; local depletion, by means of a few leeches or cupping, together with the administration of digitalis, relieved him to a certain extent, but the bronchitis never completely disappeared; the emphysematous condition of the lungs, of course, remained, but the dyspnea was usually rapidly relieved, and he was able to return to his work, which was principally driving a dairy cart. No matter what amount of recovery he made there was one symptom that always remained constant—a more or less permanently blue condition of the face and upper part of the body. This condition made us add to our diagnosis that most probably there was a communication between the two sides of the heart. The last time of his admission to hospital was from a fortnight to three weeks ago.

[a] These reports are furnished by the Secretary to the Society.

He came in after a very cold day, and his breathing was now more embarrassed than upon any former occasion, and the surface of his body was colder. It was more difficult to get him out of the state of collapse in which he was than it had ever been before. He made, however, a pretty fair recovery. The amount of dyspnea from which he suffered was relieved, and he was able to get up in the latter part of the day, and the quantity of expectoration was greatly diminished. A few mornings ago he left the ward very early to retire to the water-closet, and he fell on the floor; he was carried back to the ward, and lived only a few hours. The *post mortem* examination exhibits a very well-marked example of the emphysematous condition of both lungs, with a great deal of blood retained in their structure; there is not much evidence of chronic bronchitis, but dispersed through the lungs here and there are well-marked nodules of pulmonary apoplexy, large, firm, and hard, and distinctly circumscribed. On examining the heart we find the whole organ enlarged, the right ventricle very large, the cavity greatly dilated, and the walls greatly hypertrophied, and the right auriculo-ventricular opening very wide, allowing the introduction of four fingers, easily. The left ventricle is also enlarged, and its walls are greatly hypertrophied. There is not any narrowing of the left auriculo-ventricular opening; it is, perhaps, a little wider than normal, and the mitral valve is somewhat thickened—enough, certainly, to allow freely of regurgitation from the ventricle into the auricle. On examining the auricles we find both enlarged. The right auricle is greatly enlarged, and both the Eustachian valves are larger than normal. The left Eustachian valve, which is not usually very easy to demonstrate, is perfectly distinct and well-formed; and, as we presumed from the permanence of the cerulean complexion, there is a free communication between the two auricles through which a probe passes very freely. This, so far, is not an uncommon case of the relation that we might expect to find between lungs diseased in this way and a heart suffering from congenital malformation; but there is another point of greater interest connected with this case. On examining for what could have produced such an amount of hypertrophy of the left ventricle as existed in this case, and not considering that the large amount of regurgitation which was possible between the ventricle and auricle sufficient to account for it, we made further investigation. It was not to be found in any renal degeneration, and on looking for obstructive disease in the aorta, we failed to find any; but on tracing the aorta for some way we found a condition of disease which appears to me to be very rare indeed. The aorta is not diseased at its commencement; but as we pass up the arch and towards the abdominal aorta, we find the descending aorta covered throughout with an exudation which encircles the entire circumference of the vessel. It can be raised from the lining membrane without much

trouble, but is evidently attached to it. There does not appear to be any degeneration of the internal coat of the aorta. The lining membrane appears to be perfectly smooth; and when we examine the aorta carefully for any calcareous deposit which might be the cause of this form of inflammatory exudation, as I believe it to be, we cannot find any.

The question is what is the nature of this deposit? During the last few days of this man's life there were no symptoms observed to make us believe he was labouring under any fresh attack of an inflammatory character. He lay in bed till the end of the day perfectly quiet; his breathing was rather improving; the condition of his pulse was rather improving, and I think as late as last Wednesday morning we made him sit up in bed, and made a very careful examination of his chest and of the entire symptoms. So that if it be an inflammatory effusion it certainly is of a very low character. It is clearly not a case of ordinary arteritis. It has none of the anatomical characters of that disease; there is nothing of effusion into the coats of the arteries; nothing of the appearances we usually find evidenced in the arch of the aorta, comparatively so often the seat of that disease; no swelling or puffing or inflation of the lining membrane; simply a discolouration of the lining membrane of the aorta, and this purulent effusion on it. Another consideration which may tend to prove it to be a form of purulent arteritis, is that these forms of low inflammations are, generally speaking, not isolated. When they occur in one part of the body we have some evidence of a low form of disease occurring elsewhere; and on carefully going over the *post mortem* appearances in the present case we find on the surface of the pericardium a more or less recent pericarditis. The serous membrane is slightly rough and red, and there is a thin layer of soft plastic lymph observable, and a semi-fluid effusion of the same character is also found to some extent here and there in the peritoneum, over the surface of the bowels. So that for these reasons I am inclined to think this is one example of that rare form of disease which has been described by Cruveilhier as *purulent arteritis.*

Dr. Hayden has favoured me with the following report of a microscopical examination of the exudation:—

"The layer of adventitious deposit found upon the lining membrane of the aorta has been again, at your request, subject to microscopic examination by me. In both the examinations which I made of it I found only fibrillary matter, which, on treatment with strong acetic acid, disappeared, leaving only a granular stratum, interspersed with oval and spindle-shaped nuclei and a few granular corpuscles. I have no doubt it was an inflammatory exudation."—*February* 1, 1868.

Tuberculous Disease of the Ovum.—Dr. Beatty said that through the kindness of Dr. Bigger he was able to lay before the Society a specimen

of a rather rare form of disease of the human ovum. It was a class of affections not very clearly understood or known, and therefore he thought every specimen produced would add so much the more to their knowledge. It was not more than a couple of hours since Dr. Bigger had brought the specimen to him, accompanied with a short account of the case of the individual from whom it came. She was aged twenty-five years, of fresh, blonde complexion, and blue eyes. She had been married five years, and had one child the year she was married, which child she nursed, and she was not pregnant from that time until five months ago, at which time the catamenia ceased. Six or seven weeks after the cessation of the menstruation her husband was seized with an epileptic fit, and she was greatly terrified. She never increased in size, nor had she any feeling of quickening, but her breasts enlarged, and well-marked areolæ were formed. She suffered from malaise, never felt well, lost strength and appetite, and a week ago got inflammation of the vagina. So severely was she affected that she was hardly able to walk, and she suffered intense pain and sickness. Dr. Bigger stated that it was impossible to make an examination. She was then ordered to keep quiet, cooling applications were placed to the vagina, and in a few days the ovum which he now exhibited was discharged. In the first place, they would remark that it was a very small sized ovum for a woman who was five months pregnant, but when they came to see the nature of the affection that he would call their attention to, they would understand why it was so. The ovum was what had been described by Dr. Granville as the *ovum tuberculosum*. There was the little fetus hanging down from the interior, with its globular umbilical cord, which was its usual form in the ovum at a very early period; but it would be seen that the fetus itself was blighted, and seemed never to have exceeded in growth that of a few weeks, while the interior of the ovum was studded over with a number of eminences which in a recent state were highly vascular, red, and extremely like the drawing which he would show them in Dr. Granville's interesting book on abortions. He was not aware that a specimen of this kind of disease of the ovum had been previously brought before the Pathological Society, and he therefore thought it would be interesting to do so on the present occasion. Dr. Beatty then exhibited one of the plates in Dr. Granville's work representing the *ovum tuberculosum*, and pointed out its exact resemblance to the specimen in his hand. There was the blighted ovum, with the large umbilical cord, and the tubercular deposit all round, completely altering the character of the ground from which the fetus could by any possibility obtain subsistence; thence the early death of the fetus as a consequence, and after a certain period the expulsion of the ovum would follow, as it always did whenever the fetus died in utero, unless there was occlusion.—*February* 15, 1868.

Aneurism of the Thoracic Aorta.—Dr. Finny said:—I have been requested to lay before the members of the Pathological Society this specimen of aneurism of the thoracic aorta for Dr. Orms Snag, 5th Dragoon Guards, under whose care the patient was from whom it was taken.

The following are the particulars of the case while under observation:

Sergeant J. D., of the 5th Dragoon Guards, was sent to me for the purpose of being medically examined previous to re-engagement at the beginning of last September. I found him a strong, muscular man, of 5 ft. 10 in. in height, ten years' service, all of which was at home, and he had the character of being a steady and temperate man. During the period of service he had been under medical care on two occasions only, once for syphilis, which was unfollowed by secondaries, and the second occasion for an attaek of diarrhea. On examining his chest with the stethoscope I discovered a well-marked systolic bellows murmur audible along the entire course of the ascending aorta, but which seemed to increase in intensity the nearer the stethoscope was placed to the heart. There were also well-marked evidences of the enlargement of that organ. With these exceptions the man seemed in perfect health, and had no symptom whatever either of disordered circulation or respiration. Greatly to his disgust and apparent astonishment, however, I refused to pass him, advising him to be very careful in his manner of living, &c., and recommended him to come to hospital and get invalided, but he persisted he was quite well, said he could do his duty, and wished to continue doing it.

On the morning of 6th December, 1867, I was called suddenly to see him, he having, the messenger said, fallen down in a fit. I found he had been standing in the barrack square, had suddenly complained of weakness, and then fallen down apparently lifeless. On my way to the case I quite made up my mind that the aneurism had burst. He was immediately conveyed to hospital, where restoratives in the shape of ammonia, &c., were administered, and warmth applied to the extremities. At this time his lips were blue, his extremities cold, and the pulse could hardly be felt. Somewhat to my astonishment, reaction rapidly set in, and half an hour after admission he was quite himself again, and stuck to his former story of being easy. I saw him several times during the day, when he seemed quite well, but the auscultatory signs were the same, and I expressed my opinion to the staff surgeon, whom I requested to see the case with me, that the aneurism existed at the junction of the heart and aorta. No change took place in the symptoms or physical signs up to 8 a.m. next morning, when, after eating a hearty breakfast, he suddenly fell back on the pillow and expired almost instantaneously.

The following are the *post mortem* appearances. On opening the thorax I found it quite free from effused blood; the lungs were everywhere remarkably healthy. The bag of the pericardium, however, was enor-

mously distended, and on opening it I found this was caused by a mass of coagulated blood of a firm consistence. Some old adhesions seemed to exist between the pericardium and the heart. The latter was much enlarged, and weighed 1¼ lbs. The source of the blood was found to be from a ruptured aneurismal pouch so near the root of the aorta as to project within the pericardium. The walls of the left ventricle were thickened, all the valves were healthy, and the interior of the aorta small, of a uniform yellowish-white colour, and free from atheromatous degeneration. In the left sinus of Valsalva, just beside the opening of the coronary artery, was a hole large enough to admit the little finger, communicating with the above-mentioned pouch, which latter was of the size of a large walnut, and the walls in some places were as thin as a wafer. With the exception of the liver, which was somewhat abnormally enlarged, the rest of the body was healthy.

This case seems to possess peculiar interest in many respects; first, as confirmatory of the correctness of the opinion of all writers on the subject, as to the great latency and want of accordance between the symptoms and physical signs of internal aneurism, and the extent of the disease. To such a degree is this the case that Drs. Watson, Fuller, and all the authors I have consulted agree in stating it is next to impossible to detect, during life, the existence of an aneurism in this situation, which seldom reaches to the size of a walnut.

This case is interesting, in the second place, on account of its rarity, not so much the infrequency of the occurrence of aneurism of the sinus of Valsalva (although it is a comparatively rare disease, as may be seen by the fact that in the records of the new series of this Society I find only two cases related), as the rarity of the opportunity of examining the patient before death, for, as the aneurism is generally so small at the time of perforation, the inconvenience resulting is not sufficient to induce the patient to seek relief.

The opinion of some that aneurism in this situation is invariably formed by the dilatation of all the coats of the artery receives no confirmation in this specimen, as it is evident here the inner coat has given way and the coverings of the pouch consist of the outer coats of the vessel and the serous layer of the pericardium.

Further, this case forms also an exception to the rule laid down by Dr. R. Smith as to the direction the aneurisms in this situation take. In his cases, so ably delineated in *Dublin Medical Journal*, Vol IX., as also in a case communicated by Dr. Gordon, and that of Dr. Bennett, to which I alluded before, the aneurisms invariably took a downward course, while the tumour before you evidently is passing upwards. As an explanation for this unusual direction, my friend Dr. Bennett suggests that the aneurism has followed the arterial reflection of the pericardium instead of that passing to the veins.

The point, however, which I consider peculiarly deserving notice in the case detailed is the length of time the patient survived the first rupture of the sac, for there seems to me no doubt that the first attack of syncope and collapse on the 6th December corresponded with the rupture of the sac into the pericardium. To explain how the patient rallied and regained, for a space of twenty-four hours, seemingly perfect health, we must look to the state of the pericardium itself. It shows evidences of old adhesions. These adhesions, I think, limited the effusion of blood when the rupture took place to a small amount; finally, however (after, probably, some undue exertion on the patient's part after breakfast), they gave way, and the hemorrhage becoming unrestrained, was instantly followed by death. This, to my mind, seems to be more likely the explanation of these phenomena than that the orifice was extremely small in the first instance, or was plugged temporarily by a fibrinous clot. For while I don't deny the possibility of either being the cause of the arrest in the fatal symptoms, yet the probabilities are against it, as we know instant death has followed a very minute opening of the aorta into the pericardium, as, for example, in the case of a girl who accidentally ran a needle into her chest, and which perforated the aorta within the pericardial reflexion. If this interpretation of the case, which I have ventured to give, be the correct one, it adds much to its importance, and brings it into the number of those rare exceptions to the rule so generally laid down by all the principal authorities on the subject, that rupture of aneurism of the root of the aorta into the pericardial cavity is always instantaneously fatal. In Professor Stokes' able book on the Heart, I find a case recorded somewhat similar to this, in which adhesions of the pericardium existed and permitted only a gradual dilatation of the sac, so that the sinking of the vital powers was very protracted.

With the exception of this case of Dr. Stokes, and another which Professor Law informs me occurred in his practice, I do not know of any others in which the hemorrhage into the pericardium from a ruptured aneurismal pouch was checked by previous adhesions. For these several reasons I considered the case worth laying before the members of this Society.—*February* 15, 1868.

Gunshot Wound—Extensive Injuries of the Pelvic Viscera.—Dr. White said the pathological specimens which he now exhibited were taken from the body of the young man named Michael Briscoe, who was shot in Gregg's-lane on the previous Thursday week. He was brought into Jervis-street Hospital at 8·30 o'clock on that evening. He was then in a state of semi-collapse. There was a small wound, evidently a gunshot wound, in the right groin, over Poupart's ligament, about an inch from the spinous process of the ilium. He (Dr. White) had not an opportunity of seeing him in the first instance. Dr. Stapleton saw him soon

after he was brought in. There was then some hemorrhage. Dr. Stapleton examined the wound. Passing a probe inward he found it passed behind the femoral artery, and not feeling any trace of the bullet he did not like to push the exploration further, and closed the wound. The case was then handed over to his (Dr. White's) care. He remained the greater portion of Thursday night with the patient, who was vomiting from time to time, and who, as the night advanced, began to suffer very acutely from pain, referable to the lower part of the sternum. His appearance seemed to indicate some hemorrhage going on internally. Externally there was no hemorrhage from the time the wound closed. He got relief between three and four o'clock in the morning, and also ceased to vomit. He then remained at ease from four o'clock in the morning until between twelve and one o'clock on Friday, when the vomiting returned, and with it some pain in the abdomen, on pressure over the right iliac regions. In the afternoon of Friday, at half-past three o'clock, he (Dr. White) saw the patient, and found a good deal of abdominal tenderness on the right side, extending from the epigastrium to the right iliac region. On the left side there was no pain on pressure. He saw him at half-past seven o'clock, and found him not perfectly recovered from collapse. His features were pinched, his pulse 160; there was an increase of tenderness of the abdomen, and some tympany. He had a return of vomiting. He saw him at eleven o'clock that night. The pulse had then come down to 132. He expressed himself as being much easier, and he left him at twelve. He did not see him again until Saturday morning. He then found the abdominal symptoms increasing; the belly was very tense; the pain, on pressure, which had been confined to the right side, extended over the entire abdomen. He vomited several times during the night, although considerably under the influence of opium. He could bear a light poultice on the abdomen, but not the weight of much clothes. The decubitus was on the back. The pulse rose to 160, and on Saturday morning, after ten or eleven o'clock, he was unable to count it. During the afternoon the symptoms of collapse increased, though he was conscious and able to converse. As the evening advanced his features became sunk and pinched, and when he (Dr. White) saw him between ten and eleven o'clock he was evidently sinking. He retained his faculties up to the last moment. There was some abdominal uneasiness, but no pain, except on pressure. The vomiting continued at intervals up to the time of death. There was numbness throughout over the course of the anterior crural nerve. In making the *post mortem* examination he opened the abdominal cavity, reflecting it backwards. He did so with the view of confirming his opinion, which was, that the man died of peritonitis and hemorrhage into the abdominal cavity, the result of a bullet wound penetrating the peritoneum and perforating the intestines.

The abdominal cavity was full of bloody serum, with large clots of blood in the lower parts, the pelvis being full of dark clots; whilst in other parts the clots appeared partially softened into pus. The intestines were distended with gas, and covered with lymph, the product of recent inflammation. The portion of the small intestines which lay in the pelvis between the rectum and bladder was quite glued together with masses of organized lymph.

On emptying out the serum and clots, a small slit-like rent was seen in the peritoneum corresponding to the inner edge of the psoas muscle, and in this situation the sub-serous cellular tissue was evidently full of effused blood. At the lower and posterior part of the pelvis there was a rent larger in size and circular in shape. It was just at the left side of the sacrum, near its upper part, and so close to the rectum as to denude the muscular fibres of the rectum in that situation, but without entering the intestine. On tracing the wound from the external opening it was found to pass through the upper edge of Poupart's ligament, about an inch from its attachment to the ilium, passing inwards and backwards through the psoas muscle, through the posterior part of the anterior crural nerve, through the external iliac vein, and so through the slit-like opening in the peritoneum. The wound in the lower and posterior part of the pelvis was then traced outwards by the left side of the sacrum, and into the gluteus muscle, where, deeply imbedded in the muscle, portions of clothing were found, and about half an inch further on the bullet. The portion of intestine which lay between the rectum and bladder was perforated by the bullet in several places, but the wounds were closed by effused lymph, which glued the intestines together.

There were six openings in the intestines, and it seems a matter of surprise that he lived so long—from Thursday evening at eight o'clock until Sunday morning at one o'clock. The immediate cause of death was peritonitis.—*March* 1*st*, 1868.

Intra-uterine Fractures.—Dr. Kidd exhibited drawings, photographs, and the skeleton of a child born with numerous fractures, in the Coombe Lying-in Hospital, on the 13th of July, 1866. The mother was aged sixteen, was unmarried, and could not fix the date of conception; her labour was easy and natural, and she made a good recovery. The child was evidently somewhat immature, and was born at the end of the eighth month probably of pregnancy.

It presented a very remarkable appearance from the deformity of its limbs, the seeming intelligence and the remarkable beauty of its features; its body was well developed, its head was large and covered with hair, but its limbs were distorted, bent, and doubled on themselves. On examination during life it was found that the long bones were broken in several places, and the fragments were so loose and detached from one another, that the

limbs could be bent or put in any position. The child exhibited no signs of inconvenience or suffering. It took the breast freely, and seemed to thrive well till the ninth day, when it had a fit of convulsions, in which it died.

A careful examination of the body was made after death. It measured sixteen inches in a straight line from the bregma to the anus; it weighed four pounds fourteen ounces. The viscera generally were healthy, with the exception of an unusual fulness of veins of the dura mater, and the presence of some serum in the pericardium, but it is probable these were both *post mortem* changes. The bones of the head were very badly developed, the frontal, parietal, and occipital, presented merely central points of ossification. The bones of the base of the skull were also very imperfectly developed, and were each divided into several portions.

Both humeri were fractured below the head, the radius and ulna of each side were broken in two places. The femurs were both broken below the trochanters, and again in the lower third. The bones of the legs were also the seat of double fractures. The bones of the hands and feet were entire. The ribs of both sides, from the third to the tenth inclusive, were each broken in two places. In all fifty-four fractures were discovered. Many of the fragments were covered with callus, in some places forming a complete union, while in others no attempt at repair had been made, showing that the fractures had occurred at different dates. There were no traces of inflammatory action at the fractures.

The occurrence of intra-uterine fracture from violence done to the mother during pregnancy, is well known, in one case, described by the late Dr. Montgomery; the child was born dead, with several fractures and other injuries, a few hours after the mother had fallen out of a window twenty-five feet high, an accident that did not prove fatal to her. Brodhurst has recorded two very similar cases. The children were born alive, but not till some time after the injuries were inflicted, and in both cases the bones were re-united. Fractures are also sometimes caused by unskilful manipulations during delivery; but it is obvious that the lesions in the present case could not be attributed to either of these causes. The true explanation seems to be that the bones were in an unhealthy or rickety condition, and that they were so was evident from their appearance and softness, and that the fractures were produced by muscular action. There are very many cases of intra-uterine fracture from this cause on record, of which the most remarkable is that quoted by Malgaigne from Chaussier, in which there were altogether 113 fractures found in a child who lived twenty-four hours after birth.—21*st March*, 1868.

Obstruction of the Bowels—Extremely Long and Tortuous Colon—Extensive Atheromatous Degeneration of the Arteries—Ramolissement of Spinal Chord.—Dr. Hewitt said the case which he was now about to bring under the notice of the Society was one of some interest. It was that of

a woman between seventy and eighty years of age, who was admitted to the City of Dublin Hospital under his care on the 3rd of March, presenting the following symptoms. The pulse was 88, and was extremely hard. She had a dry, brown tongue, which was extremely rough, and she had not had any motion of the bowels for ten or twelve days before. For two or three months previously she had had only a few motions—that is, about once or twice in the month. There was neither pain nor tenderness in the abdomen, which was apparently so lax that he could draw up the integument, and hold it in his hand three or four inches from the surface; but this was chiefly due, although the woman had never been pregnant, to the thickening of the parietes and the great quantity of fat deposited in the subcutaneous areolar tissue. There was, however, great resistance on pressure of the abdomen, but no definite tumour could be detected by either palpation or percussion. In consequence of the state of the tongue, he thought it advisable to give no cathartics by the mouth, and he directed the nurse to administer an injection every four hours till the bowels were moved. After two injections had been given a large quantity of hardened feces was passed, and the woman was a good deal better the next day. The tongue had lost its dryness and the pulse some of its hardness. The injections were repeated, and were discontinued because they brought nothing away. For three or four days she appeared somewhat better, but still lost appetite, and the tongue became again dry and hard. It was then thought advisable to try the effect of cathartics by the mouth, and she was ordered a combination of rhubarb pill and croton oil. Two or three of these having been vomited, they were discontinued. She was given one grain of opium and one-fourth of a grain of extract of belladonna every four hours. After she had taken three or four of these she exhibited some symptoms of narcotism, and he thought that it would serve no good purpose to persist in this line of treatment. As the constipation still continued, and the belly had lost some of its tenseness, and there was entire absence of pain or tenderness, he considered there might be a paralysed condition of the bowels, and he tried extract of nux vomica, in combination with rhubarb pill, and the enemata were ordered to be renewed. On the day after the exhibition of this she first complained of weakness of the lower extremities, having got out of bed after the administration of an enema, and next morning she had spasms in the upper and lower limbs. At this time he sought the advice of Professor Benson. They thought it advisable to administer larger injections than those previously administered. The long tube was passed into the bowels without difficulty, and eight or nine pints of warm soap and water were slowly injected into the bowels before it began to return. When the injection fluid returned it carried with it a quantity of feculent matter in a state of solution, and containing some very small scybalæ about the size of a

pea, but not more than one-third of the quantity injected was returned. After the lapse of six hours, during which small quantities of liquid feces were passed from time to time, there was a further injection of four pints of warm water containing salt and tincture of assafetida, and this brought away much gas and some feculent matter, but no scybala. Purgatives were now administered by the mouth, and were retained, but there was no action of the bowels except when the injection was given. The spasms in the muscles of the extremities gave her much distress, especially when she made an effort to move, or when she was exposed to the air by removing the bed-clothes, but there was no loss of sensation, and she could easily move herself in bed and raise the limbs.

As she continued to refuse food and the tongue was dry and brown, and the abdomen still very tense, and in the iliac regions dull on percussion, it was resolved to try the effects of galvanism, which was at first applied to the surface of the abdomen and along the spine; it gave no pain, and had very little effect on the muscles of the abdominal wall. It was subsequently used in the manner recommended by Dr. Stokes, in a paper published in the *Dublin Quarterly Journal* in 1864, by passing a copper wire, guarded by sponge, into the bowel, and applying the other pole of the battery to the abdominal parietes; but although this caused some pain and some spasm of the abdominal muscles, it had no effect on the bowels. For several days before her death she had exhibited a most extraordinary slowness of respiration, which was of a sighing character, and varied from four to eight in the minute, although the pulse was 90. The respiration had not the character of that usual in fatty heart; and although there was well-marked arcus senilis, the character of the pulse, which was unusually full and hard, proved that there was no fatty heart. Dr. Benson thought it might be due to fatty degeneration of the diaphragm, as he had seen such cases give rise to very slow breathing. There was a well-marked systolic murmur at the apex, and one of a different character at the base, but more intense at the right sterno-clavicular articulation; it was also heard in the carotids. The diagnosis was made of mitral regurgitation and atheromatous deposit in the aorta, and in the aortic valves without regurgitation, and this was confirmed by the autopsy.

For some days before death she had small quantities of whiskey, mixed with water, given frequently, and strong beef-tea and eggs. On the 17th the pulse was observed to be weaker, and the quantity of stimulants was increased. The large injections were twice administered, and were discontinued, as the water returned quite free from feculent matter, and it was evident that the bowel was clear as far as the water could reach. Towards evening, on the 17th, she began to fail rapidly; the pulse was feeble, irregular, and often difficult to count, and respiration rose for a few hours before death to 20. The heart was examined by Dr. Benson and by myself more than once during the day, but

nothing except failure of power was perceptible. She died at 12.30 a.m. on the 18th, notwithstanding the liberal use of stimulants.

At the autopsy it was found that the colon was of unusual length, that it was sharply curved in the left hypochondrium, and then coursed across the abdomen into the right iliac region, where it touched the cecum and then turned sharply back to the left iliac fossa, whence it passed down into the pelvis to form the rectum. There was neither stricture, intussusception, or twist, and the bowels contained nothing but gas and a small quantity of liquid feces, containing some orange and apple seeds. The small intestines were free from stricture and much collapsed, and contained a considerable amount of mucus tinged with bile. The lower part of the rectum was greatly congested, but there was no evidence of inflammation either of the intestines or of the peritoneum. The diaphragm was healthy.

The pericardium contained a small quantity of turbid serum, with a few shreds of soft recent lymph floating in it; the serous layer of the pericardium was intensely injected, and there was some recent lymph about the great vessels. This pericarditis was evidently of very recent production, and had not proceeded to an extent sufficient to give rise to physical signs, although it doubtless hastened the fatal issue. There was considerable atheromatous disease of the aorta and of the aortic valves, and some hypertrophy of the left ventricle. The mitral valves were diseased, though not to a very great extent; they were thickened and puckered, but there was no constriction of the orifice. The brain was not congested. All the arteries at the base were diseased; the atheromatous deposit was found even in the minute branches of the middle cerebral and callosal arteries. There was not a trace of softening in any part of the brain, or any clot or fluid effusion. The spinal cord was most carefully removed, and it was found that while the lumbar and lower dorsal portion presented its usual appearance, the upper two-fifths were flattened out, and a portion in the upper dorsal region was very soft and pap-like. This softening was that variety called white softening, and was doubtless due to the obstruction in the arteries due to atheromatous deposit. The slow respiration and muscular spasms were curious phenomena, due, he thought, to this condition of the cord; and death was doubtless due to the asthenia produced by the obstruction in the paralysed bowel, aggravated by the diseased condition of the heart and spinal cord. The paralysis of the bowel was also in great part due to the diseased nerve centre, aggravated, doubtless, by the unusually long and tortuous colon which had long acted as a receptacle for feces; this view was borne out by the result of the transmission of the galvanic current, which demonstrated complete absence of electro-sensibility. The spasms in the limbs were purely reflex.—*March* 21*st*, 1868.

Secondary Rheumatic Pericarditis.—Dr. Gordon said the heart which he now exhibited was taken from a young woman who died on the previous day. It presented very well all the anatomical appearances of secondary pericarditis. The history of the case, so far as he had been able to collect it, was, that twelve months ago this girl was the subject of rheumatic fever, and at that time she had cardiac complication. However, she recovered from that to a certain extent so as to be able to leave hospital and go about, but she was never considered healthy afterwards. She had always palpitation, and hard breathing on the least exertion. It is now obvious that at that time she made a recovery from pericarditis by a very general adhesion of the folds of the pericardium, and also that she suffered at the same time from some slight endocardial inflammation. She continued in this state of impaired health for the last year, and was admitted into the Whitworth Hospital on the 15th February last, being then sixteen years of age. When admitted, she had been already seven days ill, and the symptoms under which she laboured for those seven days were symptoms of ordinary rheumatic fever, with this remarkable exception, that although she had pains in her limbs and pains in her joints there was no swelling or effusion into any of the joints. She had on the day of her admission this fever still existing, great dyspnea, and a very peculiar form of breathing, very rapid, almost entirely carried on by the diaphragm, and she adopted a curious way of endeavouring to relieve her breathing from time to time. She with her own hands made pressure on both sides of the chest, so as to try to fix the ribs and support the pericardium. She was pale of aspect, quite blanched, and sleepless. It was not very easy to come to a diagnosis as to the exact nature of the cardiac disease. A loud systolic murmur, loudest towards the apex, and extending down, audible also behind, left no doubt that there was a diseased mitral orifice, but she had besides this dulness over the pericardial region to a great extent. The first thing which seemed probable was, that it was a case of pericardial effusion. There was at the time no *exo-cardial* murmur, no *frottement* in whatever position she was placed, and no great intensity of impulse of the heart. On the contrary, the impulse of the heart was rather weak. The remarkable physical sign was the great extent of dulness. He was under the impression that it was a true pericarditis which had rapidly arisen before she came into hospital, and rapidly gone on to effusion; or, more likely, from the intensity of the symptoms under which she was still suffering, a case of purulent inflammation of the heart, in which the inflammation, extending to the muscular structure, produced this extreme cardiac debility. She had none of the appearances of a person suffering under pericardial effusion—none of that dark hue of countenance or very great congestion of the veins associated with that affection. She got small doses of mercury, large

doses of opium, to relieve pain, and was supported by wine, &c., very freely. This treatment was continued steadily for about a week, when one important symptom was relieved—the orthopnea. After being a week in the hospital the patient was able to lie down with comfort; but even this relief was of short duration. So far as the cardiac symptoms were concerned there was extraordinarily little alteration during her stay in hospital, but after a very short time she got vomiting. The dyspnea and orthopnea, which were before so distressing, returned; she became dropsical in the lower extremities, and the breathing became so rapid that she had to lean forward to perform the act of respiration. A day or so before her death it became evident that she was suffering from pulmonary congestion. On making a *post mortem* examination there were found well-marked evidences of the former attack of pericarditis. There were parts in which, no matter what amount of traction or dissection was used, separation of the two folds of the pericardium could not be affected. In addition to this there had been also adhesive inflammation of the outer layers of the pericardium, causing an obliteration of the anterior mediastinum and thickening of the adjoining structures. The effect of this was, that what is usually termed the free layer of the pericardium was more or less fixed; and when the two serous layers became adherent, the heart itself became fixed also, and, as a consequence, became hypertrophied with dilated cavities. On this point, perhaps, turns the solution of that question not yet determined—"What is the effect of obliteration of the pericardium upon the heart as to its hypertrophy or atrophy?" In a communication made to this Society by our learned Secretary, Dr. Stokes, he stated, I think, on the authority of Professor Smith, that many cases of adherent pericardium were followed by atrophy of the heart, and perhaps as many by its hypertrophy; and this becomes perfectly intelligible if we examine the two conditions under which it may occur. And omitting altogether the cases in which endocarditis also occurs, and produces its consequences of hypertrophy or atrophy, if in addition to the inflammation which takes place in the interior of the pericardium, there be also an adhesive exo-pericarditis (the existence of which, even during life, Fuller and others are prepared to demonstrate); then the condition of parts will be as in the case before the Society, the external fibro-cellular layer of the pericardium adherent to the wall of the chest, the cavity of the pericardium obliterated; and then an unyielding pericardium investing the heart will of necessity cause a dilation of its cavities and more or less hypertrophy of its walls; whereas if the external fibro-cellular layer be unattached, except through the adhesion of the serous membranes, the consequences will be more or less compression, and consequent atrophy of the heart. A somewhat similar condition prevails in certain forms of pleuritis. If the layers of the pleura have adhered, and from any cause

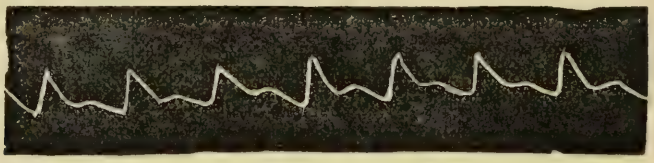
the wall of the chest is unyielding, the consequence will be a dilatation of the bronchial tubes, or other yielding parts of the lung; whereas, if the super imposition of lymph be confined to the pulmonary pleura, the consequence will be a compressed and atrophied lung. The present case showed the amount of hypertrophy possible to take place within a year under such circumstances, and in a young person; the shape of the heart was much altered; it was shorter and wider than natural, and on making the usual section of it, both auriculo-ventricular openings were found dilated, the left very much so, admitting the introduction of four fingers. There was not perfect obliteration of the pericardium in the former attack. In some places the amount of lymph thrown out was very great, layer upon layer well organized, and having now very much the appearance of muscular tissue; but in other parts there were small pockets or lacunæ, which were the seat of recent inflammation, the inflammatory exudation consisting in very soft, almost diffluent, lymph. This secondary rheumatic pericarditis occurring in the different chambers where the obliteration had not been so intimately carried out, and affecting also the organized false membrane, caused an amount of suffering and pain which seemed to be of a different character from the symptoms of what might be termed cases of ordinary pericarditis. The intensity of the suffering in this case may be attributed to the fact, that the whole poison of the rheumatic fever spent itself here, for although there were muscular pains in the limbs and pains in the joints, there was no effusion into any joint in the body.—*March* 21*st*, 1868.

Cerebro-Spinal Arachnitis.—Dr. Grimshaw exhibited the brain and portions of the spinal cord removed from the body of Patrick E———, aged twenty years, late a member of the Royal Irish Constabulary.

The patient was admitted into Steevens' Hospital under the care of Dr. Burke; a few days after admission he was transferred to Dr. Grimshaw, under whose care he continued during a considerable portion of his illness.

The patient was admitted on January 13th, 1868, in a state of collapse, the muscles being rigid; there appeared to be some hyperesthesia of the arms; there were numerous purpuric spots slightly raised, and shotty to the feel, scattered over the body and limbs, being especially plentiful on the legs. His illness, which commenced with vomiting of greenish matter, pain in the head, and stiffness of the neck, had continued for three days before admission. The case was at once diagnosed to be one of cerebro-spinal meningitis. On the following day he said he was considerably better; he was quite sensible, his limbs were warmer, and the stiffness less than on admission; the hyperesthesia was considerably more evident than on the previous day; complained much of pain in head and stiffness

of neck; his pulse was that of imperfectly-filled arteries, rapid and jerking, as shown by the accompanying tracing.



On the 14th day he was so much better that he considered himself convalescent. On the 15th day the pain in the head returned, causing great suffering; there was also vomiting; temperature in axilla, 99°.5 (Fah.) 16th day—Pain gone; temperature, 100°. 17th day—Pain returned; temperature, 102°.5. 18th day—Considerably improved; temperature, 102°.5. This improvement continued until the 21st day, when he was seized with more violent pain than he had yet experienced, and when seen by Dr. Grimshaw, at 10 a.m., was screaming from the intensity of the pain. At this time his temperature reached the extreme height of 110°, falling to 105°.5 at one o'clock, at which time the patient vomited, and his condition considerably improved. From this time the patient went on, sometimes better, sometimes worse, becoming greatly wasted and passing under him. Two small abscesses in the neck, and large bed sores formed towards the end of February. On March the 23rd (the 75th day) a large bulla formed on the left thumb, and the patient died on the following day at half-past seven a.m., the duration of the illness having been 76 days. On examination of the body a large quantity of fluid was found effused in the sub-arachnoid spaces; there was slight effusion of lymph (which was still visible) on the arachnoid at the base of the brain. No lymphy exudation was observable on any part of the membranes of the cord. The consistence of the cord seemed normal, except near the lower extremity, where it seemed firmer than natural.

Immediately after their removal from the body, portions selected from various parts of the brain and spinal cord were submitted to microscopical examination by Dr. Grimshaw's friend and colleague Dr. Robert M'Donnell, with a view of ascertaining if any minute structural change had taken place, but no departure from the normal condition of the nerve cells could be discovered.

Dr. Grimshaw remarked upon the contrast between this case and one which he detailed to the Society on the 8th of the previous month, which terminated fatally in 86 hours; and also pointed out that the case was remarkable for the high temperature attained on the 21st day of the disease, there being only one recorded instance of so high a temperature occurring in cerebro-spinal meningitis.

Wunderlich in one case noted the temperature of 107°, 108°, and 110° as occurring immediately before death. Dr. Sanderson records a temperature of 104°. Dr. Grimshaw has noted temperatures of 104°.5, 104°.25, 103°, and 103° respectively, in five cases where the temperature seemed to be unusually high.

Another point of interest about the case was its being one of a number which arose at the depot of the Royal Irish Constabulary, in the Phœnix Park.—*March 28th*, 1868.

Spontaneous Rupture of the Heart.—Dr. T. E. Little said that cases of spontaneous rupture of the heart were sufficiently rare to render them of interest in a pathological point of view. He had the honour of now presenting a specimen of that lesion to the notice of the Society, which possessed some points of collateral interest. The subject from whom it was taken was a gentleman, aged sixty or sixty-five, who had never suffered from any symptoms referable to the heart before the attack which terminated fatally. The principal thing noticeable about him was that of late years he had fallen into a condition of extreme corpulence; he was sixteen stone weight, and yet a man of small stature. The symptoms which ushered in his death were the following:—About eight hours before his death, while after his ordinary dinner, he was attacked by a sudden feeling of oppression about the precordium, and a sense of weakness, and he vomited very considerably. In a short time he recovered, so much so that he was able to take a walk. During the rest of the evening he felt weak, shivered once or twice, and had a couple of attacks of vomiting, but felt so well that he would not allow a Doctor to be called in. He went to bed, and soon afterwards felt a sudden return of the feeling of oppression, and died perfectly quietly—"as if in a faint, his wife said." He (Dr. Little) did not see the gentleman during life. He made a *post mortem* examination on the following day. As he looked at the corpse there was nothing remarkable about it, except its extreme corpulence, and the great extent of the *post mortem* staining, and also that the temperature was higher than he should have expected it to be, considering the interval that had elapsed since death. He opened the chest and found the pericardium distended by an enormous amount of blood. He had in his mind Dr. Smith's observation as to free fat floating in the blood in cases of fatty degeneration of the heart, and he examined it very carefully, bearing this in mind, but with a negative result. The heart, as exhibited, was a little larger than usual; it weighed eleven and a half ounces. The principal thing observable on the surface was the very copious deposition of adipose tissue, which much exceeded the ordinary deposit of fat on a healthy heart. When he cut into its cavities, he found that the walls retained their normal dimensions, except at the auricles, where the deposit of fat was largest, and where they were

thinned. The aspect of the inside presented the appearance of *mottling* characteristic of fatty degeneration, though not to a great degree; and the fibres did not appear to the eye to be very pale. He then looked for the point of rupture. It had taken place at the usual position, *i.e.*, at the front of the apex of the left ventricle. On the outside it presented a slight slit-like appearance of about a quarter of an inch in length, and it had taken place at a point where a large mass of superficial fat was deposited. Inside, the carneæ columnæ were considerably broken up at the seat of rupture. There was another point in connexion with this of some interest. Just anterior to, and at the right side of, this *complete* rupture, there existed a second, and *partial*, rupture, the muscular fibres being completely broken through, but the pericardium remaining, as it could be still exhibited to remain, unruptured. This partial rupture was distended with blood, and presented on the surface of the heart a small ecchymotic-like spot: so that they had here, as it were, a comment upon what had occurred in the other, and more advanced lesion. Thus they could easily believe that the rupture did not occur as a single act; but that possibly, first a breaking up of the carneæ columnæ occurred, then a total rupture of the muscular walls (as in the case of partial rupture), and that not until some time afterwards did the pericardium give way.

The clinical history of the case also confirmed this view. The man had symptoms directly referable to some sudden lesion of the heart, which were not immediately fatal, and it was not until several attacks of these symptoms were repeated that he died. The valves were perfectly healthy, if we except the existence of a few spots of atheroma. The coronary arteries, with the same exception of a slight degree of atheromatous deposit, were also quite healthy; and there was nothing to explain the lesion in their condition.

A miscroscopic examination of the heart showed a condition of fatty degeneration of the cardiac muscular tissue, extremely capricious in its extent in different regions, so that he could with difficulty say where the greatest amount of it was to be found. Where the rupture took place some of the fibres were extremely degenerated, while in the immediate neighbourhood of it there were others unaffected, in which the transverse striæ were perfectly distinct. Strange to say, it was in the right auricles that he found the degeneration of the fibres to have advanced further than in any other place examined. The microscope also showed that in certain places a deposition of adipose tissue had occurred interstitially, *i.e.*, between the fibres in the substance of the cardiac walls; and this not as a mere extension of the superficial deposition, for it was most pronounced in certain of the musculi papillares.

If he spoke of the pathological anatomy of this heart, as to the fat it contained, there were three points to be considered: Firstly, adipose deposit on the outside; secondly, the insterstitial deposit of fat between the

fibres; and thirdly, the true fatty degeneration of the muscular fibres. Another fact observed by the microscope was, that imbedded in the fibres of the right side (where alone this was observed) there was a quantity of crystalline structures of a reddish brown appearance, which he took to be blood crystals. As to the etiology of these conditions, they might easily believe that the adipose depositions were connected with and a part of, the general corpulent condition that this man had fallen into during the latter years of his life; but he believed pathologists did not think fatty degeneration of the heart had any connexion with corpulency; nor indeed did there appear to be any good reason why such a connexion should be expected to exist in the heart's case, which clearly does not maintain in cases of the same lesion in other organs. It might be possible, however, that, whereas fatty degeneration was not connected with a general tendency to deposit of fat, at the same time the impediment placed upon the nutrition and functions of the organ by the quantity of fat collected round it might have led to this as a secondary lesion, and that thus the two conditions might stand to one another in the relation of cause and effect.—*March 28th*, 1868.

Abscess in the Wall of the Chest opening into the Lung.—Dr. Banks said:—A boy, aged eighteen, was admitted into the Whitworth Hospital on the 28th of March.

His health was reported to have been good up to a month before his admission, when, after exposure to cold, he was attacked with cough, accompanied by abundant purulent expectoration, which soon became fetid. The cough, with breathlessness on exertion, continued, and he rapidly lost flesh; and he was so weak on the day he was received into the hospital that he could with difficulty support himself in the erect posture.

The surface of the body was cold, and the countenance indicative of great anxiety; the breathing laboured and rapid (50 in a minute); pulse feeble, and 120.

Cough very distressing, and expectoration copious, and extremely offensive. On examination of the chest the left lung was found to be dull from apex to base, and the respiration, over a considerable extent, bronchial, with loud gurgling râles.

The upper and anterior part of the right lung was also dull. About one inch below the left nipple a swelling was observed which was about the size of a hen's egg, and painful on pressure. There was distinct fluctuation, but no impulse was perceptible on coughing.

The liberal administration of stimulants, and the application of warmth, caused him to rally from the almost moribund state in which he was on admission. The breathing and the pulse, however, rose in frequency, the former to 70, and the latter to 140.

It was determined to open the abscess, and accordingly an incision was made an inch below the nipple, where the integuments were glazed and thin, and the fluctuation was distinct. A large quantity of fetid pus, mixed with air, escaped, and marked relief to the most distressing symptoms followed the operation, and he could now lie on the right side, which he could not do previously.

The improvement was short-lived. The respiratory distress soon returned, and he died on the fourth day after his admission into hospital. The *post mortem* examination was made by Dr. Purser.

On examination of the external wall of the chest, the abscess was found to communicate with the cavity of the pleura by three openings, one between the fifth and sixth rib, and two between the sixth and seventh. The openings led to a cavity about the same size as the external abscess, situated between the parietal wall and the lung. The surface of the lung presented a depression which admitted the end of the little finger. No communication with a bronchus could be discovered, but air obviously escaped, as was observed on the opening of the abscess. The whole left lung, with the exception of the site of the internal abscess, was adherent to the parietal pleura. On making a section of the left lung, it was found to be infiltrated with pus; numerous little cavities, about the size of a hazel nut, existed, especially at the posterior part. The upper lobe was studded with a vast number of yellow spots about the size of a pin's head, closely resembling miliary tubercles, but which were found, like the larger, to be collections of pus.

The right lung was likewise infiltrated with pus over a great extent, so much so that the lower lobe seemed to be all that was available for respiration. The only other organ, in addition to the lungs, presenting morbid appearances, was the heart, on the surface of which were traces of recent inflammation.

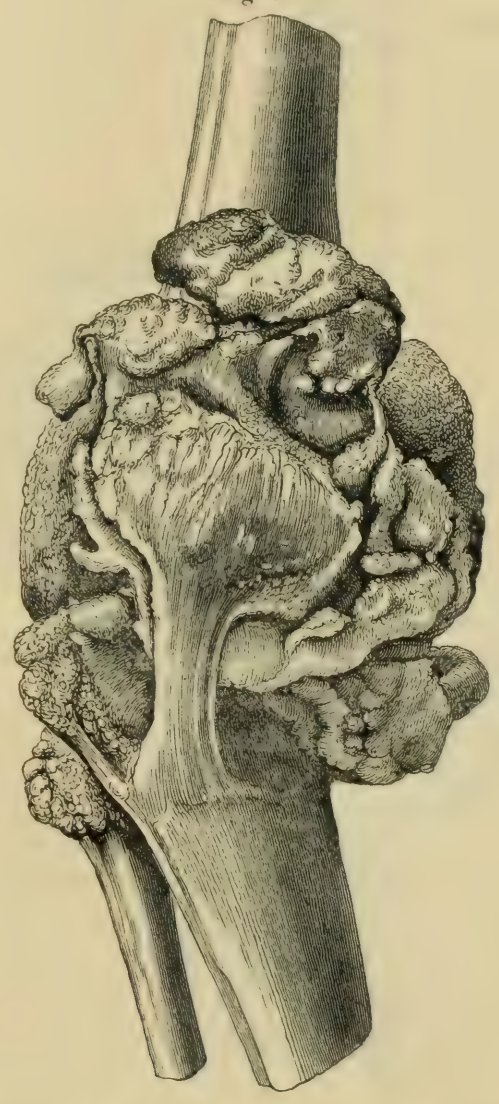
Dr. Banks looked upon the case as one of no ordinary interest, and which, from his experience, he believed to be very rare. He could not recall to his memory having ever seen one of exactly a similar nature. So far as the lungs were concerned, he supposed the disease originated in pneumonia, which terminated in diffuse suppuration.

It was manifest that the external abscess made its way inwards, perforating the intercostal spaces, and finally establishing a communication with the lung, as was proved by the expulsion of air bubbles, after the first gush of fluid, on opening the abscess.—*April 4th*, 1868.

Chronic Rheumatic Arthritis of the Knee-Joint.—Mr. Edward Hamilton said the records of the Society abounded with cases of chronic rheumatic arthritis of the knee, and other joints, but as the specimen before them illustrated so well the anatomical characters of this disease, as it affected the knee, and presented some features in themselves so remarkable, that he

thought the specimen well worth being brought under their notice. The specimen was taken from the body of a man fifty years of age, brought for dissection. The knee-joint of the right side appeared to be considerably deformed, and enlarged. On removing the integuments, the subjacent fibrous structures were much thickened, and in some spots ossified. It was a remarkable fact, and attention had already been called to it by Mr. Adams, that the *ligamentum patellæ*[a] generally remains unaffected by this disease, and he observes that this freedom from swelling in the situation of it is a circumstance well worthy of our attention, as it

Fig. 1.



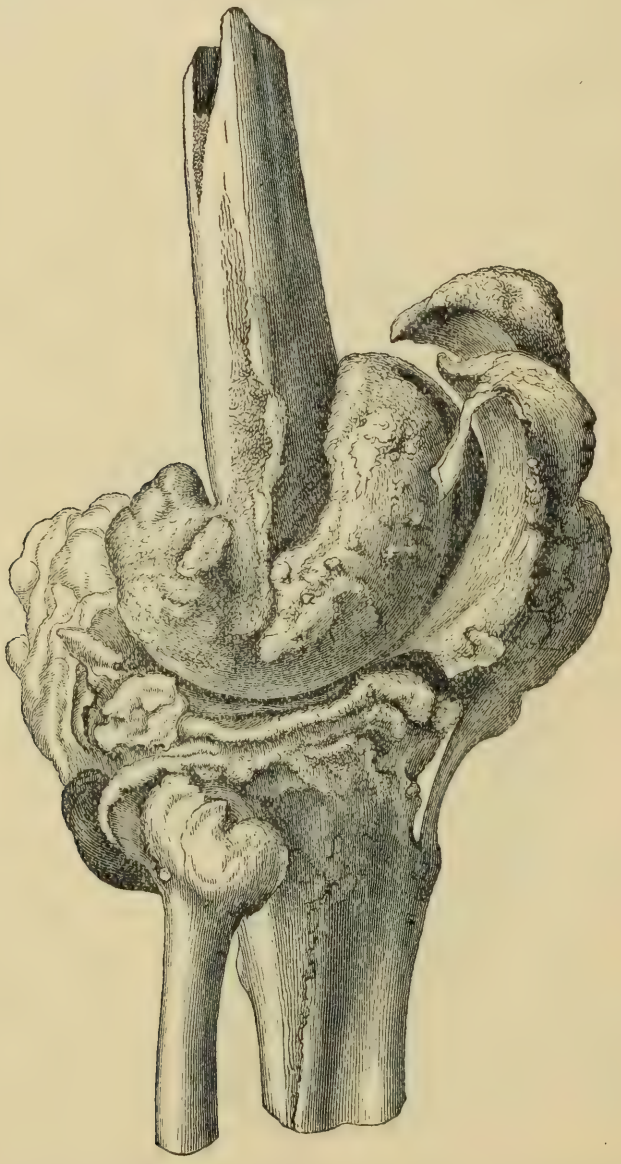
may aid our diagnosis of this disease in the living patient. There was, in this instance, no alteration in this ligament, while all the structures around it were completely changed. On opening the joint we find the

[a] See Adams on "Rheumatic Arthritis"— Atlas, Plate IX., Fig. 1—E.

synovial membrane had undergone extensive alteration. It presented the appearance of vascular processes—soft, and velvety—in short, vascular fimbriæ or fringes, so characteristic of this disease.

They might also here observe that remarkable and dilated bursa which Mr. Adams had called attention to,[a] as forming the popliteal swelling, so frequently to be found associated with the chronic synovitis of this disease. We have also to remark that only a small portion of the semi-

Fig. 2.



lunar cartilages had remained. The cartilage of incrustation had been removed, its place having been supplied by ivory-like surface.

The most striking changes were those which the osseous tissue had

[a] See page 190, T. on C. R. A.; also Atlas, Plate IX., Fig. 1—B.

undergone; and here, they had to observe, found conspicuous depositions of what Mr. Adams has named, with reference to this disease, as "additamentary bones."[a] Both condyles of the femur were greatly increased in size by exuberant growths of bone, which seemed to be heaped up in front and behind the lower extremity of the shaft of the femur, which itself seemed to have been pressed down so as to give an idea to any one unacquainted with this disease, that a fracture by impaction had occurred. (See Woodcut, Fig. 2.) As to the patella—(Fig. No. 1)—they could see its normal outline, and the mass of additamentary bone forming a circumference, presenting numerous irregular masses around. The patella itself posteriorly had been added to, and the bone hypertrophied in such a manner that it amounted fully to one inch in thickness. There was another feature in the case, that, before he concluded, he would allude to, namely, that as in the generality of cases of this disease, they found that the direction of the knee was inwards, and that the affected one approximated the other; but it was to be observed that in this case the whole limb seemed at the knee to be bowed outwards. The disease here seemed *local*—bony anchylosis had taken place between the tibia and fibula near the articulation at the knee.—*April 4th*, 1868.

Permanent Patency of the Aortic Valves—Aortitis.—Dr. Gordon exhibited a very well marked example of the condition of the heart, which was known as permanent patency of the aortic valve. The valvular apparatus was extensively diseased. It appeared as if, by the process of ulceration, one valve and a half had been removed; and this condition was evidently of very long standing. There was no appearence of any recent disease in the heart. The left ventricle exhibited the usual consequences of so great an amount of disease of the aortic valves, admitting of so much regurgitation as must here have existed. It was immensely hypertrophied and dilated.

So far, the interest of the case consisted chiefly in showing the condition of a heart, in which the valvular apparatus of the aorta had been destroyed by rheumatic disease fifteen years before; for the history of this case was, that at that period this patient had suffered from very severe rheumatic fever, when his heart was extensively diseased; and he had never since been kept from work until a few weeks ago. The abnormal state of the left ventricle, as presented, was therefore the result of fifteen years' growth, and had progressed so steadily as to allow of this patient continuing his ordinary occupation as a carpenter, with comparatively little inconvenience, up to a very recent period before his admission into hospital. He then began to complain of weakness, oppression of breathing, and palpitation. When he came into the hospital, it was

[a] See page 38, læs cetat.; also Atlas, Plate VII., Fig. 3, 66.

clear that he had permanent patency of the aortic opening to a great amount, which the hypertrophied, left ventricle, and the history of the case, showed to be of long duration. But he had now, in addition, symptoms of angina, which were considered to be due to an inflamed aorta. He had a very constant short cough, orthopnea, and an enormous amount of expectoration—the latter was not such as that found in pulmonic disease; it was serous, frothy, and largely tinged with blood, and sometimes amounted to two quarts in twenty-four hours. The man never made the least rally; but gradually became weaker, and this weakness was his great complaint.

The hypertrophied heart was perfectly able to carry on the additional work which had been *gradually* imposed on it, and for which it had time to prepare; but when further increase of labour was suddenly put upon it, it proved quite unequal to the required exertion, and rapidly failed.—*April 25th*, 1868.

Calculus removed through the Urethra from the Bladder of a Child.—Dr. Fleming exhibited a calculus which he had removed with a urethral forceps from the bladder of a little boy under two years of age. The boy was suddenly attacked with retention of urine, having suffered from painful and frequent micturition for a few days previous. When he was brought to hospital he was forcing and straining to pass water, the bladder was distended as an oblong tumour, reaching from the pubes to the umbilicus. The penis was in a state of partial erection, and the child was dragging and pulling it most violently.

Dr. Fleming at once suspected, from the peculiar character of the symptoms, that there was a calculus impacted in the neck of the bladder or in the urethra, and having ascertained its position when relieving the retention of the urine with a silver catheter, he quickly dilated the urethra, and in the interim provided himself with a special forceps for the purpose, and was fortunate enough to catch the calculus as he now presents it to the Society, secured within the blades of the forceps. He remarked upon the importance of the diagnosis of such class of cases, and upon the paramount value of the early detection of a calculus of a size removable by so simple and efficient an operative expedient. He had removed, in many instances, calculi from different portions of the urethra of children, but in none did he remember a case where a calculus caught *within the bladder* was so satisfactorily or with so much facility removed. Though by no means favourable to the operation of lithotrity in children, he had yet provided himself with a plain-bladed lithotrite of Charrière which he purposed using had he failed with the forceps in the case under observation. Dr. Fleming exhibited the catheter and the forceps he was in the habit of using in such cases, as he attached some importance to their peculiar forms.

The calculus removed was small, was somewhat larger than a duck shot, was slightly roughened on its surface, and consisted wholly of lithic acid. It was obviously renal in its origin, and from the accompanying characteristic symptoms it tended to confirm the opinion inculcated by Dr. Fleming in his clinical records of injuries and diseases of the urinary organs, that many, very many of the abdominal sufferings so common in infantile and in child-life, are attributable to the unobserved escape of calculous concretion from the kidneys. Dr. Fleming stated that he has found in the kidney of the fetus in utero, and in not a few instances in that of the infant and of the child, small gritty particles consisting of the oxadate of lime or of lithic acid crystal impacted in the tubercular structure. He directed special attention to the remarkable dilatability of the urethra at this early period of life, as being of much practical moment.—*July*, 1868.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE KING AND QUEEN'S COLLEGE OF PHYSICIANS.

On an Epidemic of Malignant Measles at Sydney, N.S.W. By WALTER J. CARROLL, L.R.S.C.I.—I have observed from the medical papers that much controversy is occurring in Dublin relative to a late epidemic which some have called purpuric fever, while others prefer the name of febris nigra. I am, as you may be aware, in large practice here, and having observed a great analogy between the febris nigra of Dublin, and a form of malignant measles very common here lately, I think it right to record the circumstance.

In the first five months of the present year there raged in Sydney the severest and most general epidemic of measles which it has ever known. It commenced so mildly, that of the first 250 cases which I treated none died. Unfortunately, I soon met with a malignant form of the disease. In this the eruption was always darker than it ought to be, sometimes purple or chocolate, and persistent, for often eight or ten days, if the patient lived that time. In some cases of greater malignity only a few dark spots, sometimes so few indeed as to escape notice, appeared on the face or thorax, while on the extremities three or four vesicles would form, which would appear in the morning, perhaps no larger than a flea-bite, and at noon would be so extended as to involve a surface equal to the disc of a stethoscope, at which size they would usually break, exposing a black or chocolate surface, gangrenous to the sight and smell. This, if the patient still existed, would spread so as to lay bare and raw in twenty-four hours, almost the entire surface of the body. In all forms the tendency to convulsions was most remarkable. By them the attack was often first ushered in, and almost every case

which died terminated by them. Some cases, which undoubtedly gave evidence of ventricular effusion and spinal lesions, were remarkable for the duration of life, when complete paralysis of all voluntary muscles, and inability to eat or drink, existed. The patient, perfectly and hopelessly comatose, has subsisted, to my own knowledge, ten and twelve days upon nutritive enemata. It is worthy of remark, that no practitioner doubted the cases I mentioned being measles. We all had them more or less. My practice being more among the middle and working classes, and very much among the clubs, I believe I saw and treated more cases than any other person in Sydney. I compute the number at 900, and my loss at six per cent.

This epidemic did not conform in its course to the law to which epidemics are supposed to be subject. It came mildly, and gradually became general and severer till the very bad cases were numerous, which prevailed to the end.

An aphthous condition of the mouth, and, I believe, likewise of the intestinal canal, was present in many cases. I have heard of cases so bad, chiefly in the benevolent institutions of the city, that gangrene of the cheeks and complete sloughing of them occurred. Some of our practitioners called this complication cancrum oris, while others preferred the newer one of stomatitis. All considered it a consequence of the morbid poison of the measles, and low vitality resulting therefrom. Besides the most marked tendency of this epidemic to induce cerebral and spinal complications, another much more general, but in proportion not quite so fatal, existed. Almost every case presented more or less intestinal irritation. Dysentery and diarrhea were very prevalent, and often most intractable. Inflammation, simply of the large intestine, often demanded attention when all other symptoms were light. From the foregoing you will see that our disease was extremely prostrating, and of, very frequently, a putrid character.

Reports give a most startling account of the mortality in the public institutions. It has ranged from 6 to 12 per cent.

The following is an extract from the report of the medical officers of the Benevolent Asylum:—

"During the epidemic of measles (March—May, 1897) there were about 290 children and infants in the Benevolent Asylum; all the above were attacked. There were 38 deaths, of these 27 occurred in the case of foundling children and infants under three years of age. Of the healthy children only 11 died. It is to be remembered that the majority of children received into the Benevolent Asylum are far below par as regards every matter of health; they are the offspring of the dissolute and the diseased.

"The character of the epidemic amongst the children was extremely malignant. Many of the children and infants died within twelve hours

of the first appearance of the rash, and quite comatose. Others within a shorter period died convulsed. The majority had putrid sores of throat and mouth, and died within a week of their first seizure."

I consider this report in the main reliable. I consider, however, that many cases of convulsions, preceding the appearance of the rash, were registered to the credit of the convulsions; whereas the likelihood was they were due to the latent measles. This remark I do not make in disparagement of the quotation I have given you, but on the probability of some errors in the Registrar-General's Report for the past year, which is not yet at hand. I know we had all a wish to keep our percentage of deaths very low; and some persons, I believe, went to a greater length, when, through accidental circumstances, the rate became high, by certifying to the complication and not to the general disease; thus they reduced the ratio.

My treatment was in all cases most stimulating. When the disease was severe quinine and turpentine were freely given. Where irritation of the intestinal canal was present I gave, night and morning, ½ gr. of calomel, besides every two hours alternately I gave two or three minims of Spt. Terebinth., and an astringent, antacid mixture containing Tinct. opii. and Trisnit. Bismuthi. Of the many modes I tried I found this the best. The calomel acted gently on the liver, and improved the secretions. Brandy, port wine, isinglass, and beef-tea, where permissible, were freely given.

Some persons here used largely the bisulphites of soda. I cannot, however, speak freely of them, as my experience was limited to two fatal cases. Many do, however, praise them highly here. I have administered pot. chloras; it was of service, but not equal to the turpentine. I sometimes thought that it had provoked that severe irritation of the bowels which sometimes caused diarrhea, and sometimes dysentery, and was always hard to manage. To the rectified Spt. of turpentine, given in an emulsion with or without quinine in solution, my most marked recommendation is given. It surpasses all other stimulants, being the most rapidly diffused, and maintains the circulation in the engorged capillaries of the lungs, the integument, or the extremities. Under its use I have seen respiration improved, the eruption grow brighter, and the circulation increased, heat being generated. It is, therefore, indirectly, if not directly, an oxygenizer of the blood. The dose which I have named above is a medium one for a child one and a half year old.

The Registrar-General's Report on the vital statistics of Sydney and suburbs during the months of February, March, April, May, June, and July, 1867, show a gross mortality of 645 from measles during these six months.

The monthly tables were as follows, viz. :—

February	15	Deaths
March	147	„
April	266	„
May	149	„
June	56	„
July	12	„
Total	645	

Some Cases of Aphasia, communicated by Dr. Œdmansson. Translated from the *Hygiea* for June, 1868, by William Daniel Moore, M.D., Dub. et Cantab.; M.R.I.A., L.K.Q.C.P.I.; Honorary Fellow of the Swedish Society of Physicians, of the Norwegian Medical Society, and of the Royal Medical Society of Copenhagen; Secretary for Sweden, Norway, and Denmark, to the Epidemiological Society of London.

The disease, or rather the morbid symptom, which has for some years borne the name Aphemia or Aphasia, was not unknown in ancient times. Trousseau quotes a passage from Pliny,[a] where the latter, after having given some examples of unusual memory, states that the memory may easily be affected by various causes, and quotes some instances in which persons have forgotten the names of their acquaintances, and even their own names, or the letters of the alphabet. Dax and, after him, many others, reproduce the following remark of Schenkius,[b] where the latter makes a certain Oethæus say: "Observatum a me est, plurimos post apoplexiam aut lethargum aut similes magnos capitis morbos, etiam non præsente linguæ paralysi, loqui non posse, quod, memoria facultate exstincta, verba proferenda non succurrant."

Frederic Hoffmann[c] describes, under the name of aphonia, five cases which afford more or less distinct examples of aphasia. He defines aphonia to be an incapacity to speak or to produce articulate sounds, depending exclusively on a defect in the tongue, the cause of the latter being a lesion of innervation. That he does not mean an absolute loss of the power of articulation is shown by this, that one of his patients could the whole time say "mama." He distinguishes also certain forms of aphonia "ex vera linguæ paralysi," from others, but does not go farther into the matter. As the most usual form of aphonia he specifies that which attends apoplexy and hemiplegia, and which not unfrequently

[a] Historia mundi, Lib. sept., cap. xxiv.
[b] Obs. med. rar. Lugduni 1643, p. 180.
[c] Opera omnia. Tom. 3, pp. 249, et seq. Geneva, 1740.

may continue for some time afterwards. Among other causes he enumerates congestion of the head, the abuse of spirits, violent terror, cold, intestinal worms, all causes which, with the exception of the last, have been brought forward for aphasia.

The matter is, however, put much more clearly by van Swieten,[a] who expresses himself thus: Vidi plures, qui ab apoplexia curati omnibus functionibus cerebri recte valebant, nisi quod deesset hoc unicum, quod non possent vera rebus designandis vocabula invenire; manibus, pedibus, totius corporis nixu conabantur explicare miseri, quid vellent, nec poterant tamen. Malum illud per plures annos sæpe insanabile perstat. After adding, that subsequently to an apoplexy a loss of moral courage, a degree of effeminacy often occurs, he continues: Hinc videtur patere, singulares quasdam encephali functiones manere turbatas, vel et abolitas, tota vita, quia in solo principio primæ determinationis mentis in corpus quid mutatum fuit per apoplexiam prægressam. When van Swieten thus says, that some of the cerebral functions, and among them the power of speech, may be lost, while the rest remain undisturbed, he approaches the views of a later period, and is to be considered as a precursor in phrenology. The definition of aphasia, which may be deduced from the above statement, agrees most closely with that afterward given by Broca.

It was not until the entrance of phrenology upon the medical stage that the question of aphasia could assume the form in which it now appears. Gall referred the organ of the faculty of speech, which he calls "Memoire des mots," and which he would have separated from the "Facultè du Langage, Talent de la Philologie," to the antero-inferior part of the frontal lobes. Both he and Spurzheim[b] describe typical cases of aphasia, but had no opportunity of establishing by dissection the existence of any change in the central organ assumed by them. The phrenologists based their theory of the localization in the brain of the several intellectual and moral qualities principally on facts in comparative anatomy and cranioscopical observations, while they did not understand how sufficiently to estimate, or at least how to employ the control over the correctness of their views, which pathological anatomy could afford. Modern phrenology, if we may so call the recent attempts to divide the brain into many centres, arose properly precisely from the observation, that the loss of a higher faculty, the power of speech, coincided with lesion of a certain part within the brain, and recent investigations are directed to confirm or refute this observation. The question is still in its infancy, but once started it can never be left undecided. It is remarkable that the starting point of the more recent investigations is the same as that of Gall's. Even at school he began to study in his comrades their memory for words, compared with the form of their heads.

[a] Commentar. Tom. 3, p. 288.

[b] bservat. sur la Phrenologie. Paris, 1868, pp. 304, et seq.

In passing to the most recent period in the history of aphasia we meet with Bouillaud, who as a principle assumes unconditionally the plurality of cerebral organs, but says[a] that the only thing which his own investigations have taught him with respect to the localization of the intellectual organs of the brain, or the determination of the seat of these organs, is that the anterior cerebral lobes are the organs for the formation and memory of words, *i.e.*, the principal signs for the expression of our thoughts. To this conclusion he has been led by the observation, that loss of the power of speech and of the memory of words is always a result of a disorganization in the anterior cerebral lobes, and that this power may remain undisturbed in considerable changes in other parts of the brain. But loss of the power of speech may depend also on paralysis of the muscles which serve for the articulation of words, and in such cases he has also found an alteration in the anterior cerebral lobes. Now as he assumes the existence of distinct organs in the brain for a number of combined movements governed by the brain and the will—which he has inferred from the fact, that some of these movements may be found paralysed with a corresponding limited lesion in the brain—he asserts that the organ which governs the articulation in speech, and combines the muscular movements set in motion in speaking, has its seat in the anterior lobes in intimate connexion with the organ for the memory of words.

This centre he calls "organe co-ordinateur ou legislateur de la parole." The loss of the power of speech may, therefore, according to Bouillaud, depend either on loss of the memory of words or of the "legislative power." The place in the brain, which this double organ of the faculty of speech occupies, he did not, in his first essays on the subject, wish to indicate more precisely than in the anterior lobes, but in other places he says the anterior parts of these lobes.

Marc Dax[b] bases upon more than forty cases the assertion, that loss of memory of words occurs while intelligence is preserved and without paralysis of the tongue, and that the same is always combined with a lesion in the left hemisphere of the brain. To this latter conclusion he was led by observing that the hemiplegia so often occurring with loss of speech is always dextral. He explains the phenomenon itself with Lordat, by assuming an aberration of co-ordination between the muscles used in speaking. He likewise points out the interest the fact possesses in a medico-legal aspect, as patients so affected might easily be looked upon as insane. This is true principally of the form of aphasia, in which the patient can indeed speak, but uses words incorrectly and incoherently.

This paper at the time attracted no further attention, and quickly

[a] Traité de l'encéphalite. Paris, 1825, p. 284.

[b] Lesions de la moitié gauche de l'encephale coincidant avec l'oubli des signes de la pensée. Montpellier, 1836. Gazette Hebdom. 1865, No. 17.

lapsed into oblivion, from which a son of Dax, after the appearance of Broca's essay, brought it forward.

With the exception of some papers sent in by Bouillaud in 1839 and 1848 to the Medical Academy, in which he endeavoured with fresh cases to support his opinion, the question rested almost completely until 1861, when an animated discussion arose on the subject in the Societé d'Anthropologie, in which Auburtin in particular defended Bouillaud's proposition, while Gratiolet contended for the unity of the brain.

Broca, who had previously questioned the theory[a] of the plurality of organs in the brain, went over in 1861, with a certain *eclat*, to the other camp, on account of two cases of aphasia which he witnessed immediately after one another. He goes still further than Bouillaud and Dax, asserting that aphasia is always connected with a lesion of the posterior third of the third (inferior, external) frontal convolution. In both cases the greatest change was found in the posterior part of the third frontal convolution, while in one almost the whole frontal lobe, the gyrus ascendens parietalis, the insula Reilii, &c., was more or less degenerated, in the other also the second (middle) gyrus frontalis was, although in a less degree, affected. Both were the typical cases where loss of the faculty of speech was met with without paralysis of the muscles of articulation, and at least for a long time without disturbance of intelligence. Broca considers this "symptom" to be so peculiar, that it deserves a special name, and he proposes for it the designation "aphemia." The patient both understands what is said to him, and can himself express his thoughts in writing; he has not lost the memory of words, nor the power of moving the muscles employed in phonation and articulation. To explain the nature of the aphemia he proposes two hypotheses. The one is that the patient has lost the memory of the combined movements necessary for the production of articulate sounds, and is therefore reduced to the condition of the child, who may have both the intelligence and the will, without the power of expressing its thought in words. The other hypothesis is to the effect that the aphemia is the result of an "ataxie locomotrice," limited to the part of the central nervous apparatus which governs the movements in the articulation of sound.

After Broca came forward the interest in the subject became extremely general in France. A very large number of cases were speedily published. The principal writer is Trousseau, who in his "Clinique Médicale" gives a full account of aphasia,[b] and brings forward many observations of his own. He assigns to aphasia a much more extensive signification than Broca did. While Broca defined it as a loss of the power of speech without disturbance of intelligence or of the motor apparatus, Trousseau says that such cases are indeed met with, but only exceptionally. As a

[a] Bulletins de la Societé anatomique, August, 1861.

[b] Trousseau, for etymological reasons, changed the name aphemia to aphasia.

rule other modes of manifestation of thought are also wanting, especially the power of writing, and this usually in proportion to the defect in the faculty of speech, wherewith he assumes that the intelligence is in a greater or less degree diminished. We are not, he thinks, to allow ourselves to be misled by the patient's intelligent aspect, but we should always accurately investigate the condition of his mental powers. The principal cause of aphasia he places in a defective memory. He does not wish, however, completely to identify aphasia and amnesia, but entertains the view, that we must admit the existence of various kinds of memory, and that it is the memory of words and other means of expressing thought which is impaired, without the memory having in other respects necessarily suffered any damage. The cases of aphasia in which the mental powers are undisturbed, he explains, like Broca, by supposing that the memory of the combined movements in speech is lost. A patient so affected is, he says, in the same position as the deaf mute would be if he were suddenly to regain his hearing and endeavour to imitate the conversation around him.

G. Dax, in 1863, sent in to the French Academy of Medicine an essay,[a] in which he both referred to his father's work, and brought forward several cases in support of the view, that the faculty of speech has its seat in the left hemisphere, and according to his opinion probably in the middle lobe (its anterior,[b] external part). This paper gave rise to an animated discussion, in which the chief speakers were Trousseau, Bouillaud, Parchappe, and Baillarger. Trousseau repeated his formerly announced opinion, that all means of the expression of thought (speech, writing, gesture, singing, &c.) might in aphasia be more or less lost, and that in general a lesion of intelligence is present principally in the form of defective attention and dulness of memory. He brought forward statistics of known cases, by which he endeavoured to show, that both Bouillaud's and Broca's assumption of the localization of the faculty of speech in the anterior cerebral lobes wanted sufficient foundation, and he concluded by designating aphasia as a mere symptom, which almost always, if not constantly, depends on a lesion of various intellectual powers, while he thought that different parts of the brain co-operated in speech, even if the anterior lobes play the principal part in it. Bouillaud disputed the correctness of Trousseau's statistical calculations, as well as his entire theory of aphasia. He took up Broca's stand-point and recognized only such cases as aphemia or aphasia, where no lesions of intelligence or of the muscles of articulation were met with. With this form of aphasia, "Broca's aphemia," "aphemie exterieur," which according to B. depends on a change in the "organe legislateur de la parole," and the loss thence produced of the power of combining the muscular movements, he would yet always

[a] Gaz. Hebd. 1865, No. 17.

[b] Bulletin de l'Académié imp. de Med. 1865. Nos. 14–19.

have recognized his second form "aphemie interieur," which has its sole foundation in loss of memory.

Baillarger endeavours to define more accurately the several forms of aphasia and their causes. "Aphasia simple," where a more or less complete loss of the faculty of speech occurs, ought to be distinguished from the form in which the patient utters words without connexion with his thoughts. In it there is a perversion of the faculty of articulate language. Simple aphasia has two forms—1st, Where both the oral and written language have suffered; and 2nd, where only the faculty of speech is more or less lost. The former depends simply upon a loss of memory. Not so the latter. In this, he says, the memory cannot have suffered, as the power of expressing the patient's thoughts in writing is unchanged. Nor is there any lesion of a co-ordinating organ, as many can very well articulate certain, though often only a few words. Baillarger dwells on the well-known fact, that some of those affected with aphasia cannot find a word which they wish to express, while the same word often escapes them involuntarily a little later instead of another. He considers that this depends on an inability in the will to incite to the necessary muscular movements. "Incitation verbale volontaire" has been lost, while "incitation verbale involontaire" continues. As a proof of the existence of such involuntary incitation to speak—speech without voluntary determination—he adduces speech during sleep, as well as the fact, that men often speak to themselves without knowing it. The form of aphasia where one word is used for another without connexion, he would explain by a substitution of automatic, involuntary speech for that regulated by the will.

Jaccoud[a] revives the old name alalia, and by it designates every loss of the power of speech without reference to whether the cause of it is a defect of intelligence, a defect in the conducting apparatus from the brain, in the motor centre of speech (the medulla oblongata), or in the muscles of speech. By this jumbling together the question is thrown back into the obscurity from which Bouillaud, Broca, &c., endeavoured to rescue it.

Fleury has endeavoured to introduce special denominations according to the various causes of loss of the power of speech. To these belong aphthongia, or alalia, for the form which depends on diminished mobility of the tongue; aphrasia, where the cause is to be found in abolition of the faculty of thought; and aphasia, for the form which at present occupies us.[b]

[a] Gazette Hebdom. 1864. July and August.

[b] In the 40th volume of this Journal, p. 254, I have myself briefly recorded a case of aphasia in which the patient formed correct sentences, though not a word he uttered expressed the idea he meant to convey. In this instance the powers of co-ordination and of articulation were perfect; the intelligence also was, to all appearances, perfect,

In England the subject has latterly been followed up with interest. Hughlings Jackson (London Hospital Reports, 1864) gives an account of forty cases, in all of which, with one exception, the hemiplegia was dextral. The first case with *post mortem* examination, and confirming Broca's views, was brought forward by Sanders.[a] In a recent case by the same author the greatest change was found in the insula Reilii, which led him to express the opinion, that possibly the *insula Reilii* rather than the *gyrus frontalis tertius* is the point on whose integrity the power of speech depends. Sanders assumes, with Bouillaud, two forms of aphasia—amnemonic and ataxic; but believes, nevertheless, that in aphasia a certain degree of defect of memory is always met with. Fresh cases have been published by Fox, Jackson, Simpson, Ogle[b] (St. George's Hospital Reports, 1867), &c. Ogle describes no less than twenty-five cases, in all of which the left cerebral hemisphere was altered. He considers that cases of aphasia, depending on a change in the right hemisphere, may be explained by the assumption, that a corresponding point in the right hemisphere had been developed into an organ of speech in the same manner as we occasionally see the left hand developed to perform the functions of the right.

[It is to be regretted, that in the above bibliographical and historical sketch the author has altogether overlooked the many very valuable communications on the subject of his paper, which have from time to time appeared, in the former and present series of this Journal, from the pens of Dr. Osborne (so long since as November, 1833), Dr. Graves, Dr. Banks (May, 1865), and Dr. Popham (August, 1867).—TRANSLATOR.]

From the foregoing short account of the historical development of the subject of aphasia, it is easily seen that opinions are divided respecting almost everything belonging to it. It is remarkable that the idea of the brain as a complex of many centres, distinct from each other, has been disputed by only a few among the many who have recently stated their views respecting it, though it must at the same time be admitted that many have avoided giving any definite judgment in the matter, and that the degree of independence assigned to these centres has varied. All who admit the possibility of the existence of a distinct organ for the faculty of speech, or that the loss of the latter coincides with lesion of a limited point in the brain, must, however, be regarded as also recognizing the truth of phrenology in other respects, though not precisely Gall's phrenology, with its external craniological signs of the cerebral organs;

except that the patient had forgotten the proper connexion between his ideas and the words he ought to have used to express them. Such a case would be more adequately represented by the term *heterophasia* than by *aphasia*.—W. D. M.

[a] Edinburgh Medical Journal, 1866. February.

[b] Unfortunately, I have not seen the original, but only a short notice in the American Medical Journal for January, 1868.

but a phrenology based upon the theory of the various physiological action of the different parts of the brain, especially of the cerebral convolutions.

Among those who do not absolutely deny an organic plurality in the brain is Trousseau, who, however, thinks that the investigations hitherto made do not justify such an assumption. He argues, nevertheless, though not successfully, in favour of the possibility of a different action in the two hemispheres of the cerebrum by endeavouring to bring forward proofs of pathological and anatomical differences between the two sides of the body. Thus he would maintain that intercostal neuralgia, as well as hysterical hemiplegia, scarcely ever occurs except on the left side, and asserts, with Bouillaud, that the rheumatic affection of the heart is met with only in the left side of that organ. Further, he directs attention to the different mode of origin of the two common carotids.

Again, of the authors who demand a distinct organ for the faculty of speech, this is referred by the first to one, by another to a different part of the brain. Thus Gall and Bouillaud would place it in the anterior part of the frontal lobes; Dax, senior, in the left hemisphere; Dax, junior, in the middle left lobe; Broca, in the posterior part of the third frontal convolution; Sanders, in the left *insula Reilii.* Although opinions are divided, most writers, as we have seen, and all of those who have of late accurately studied the subject, agree in looking on the left hemisphere as the seat of that organ. Many cases collected of late years, both in France and England, are in favour of the point first indicated by Broca, but against this are other perfectly reliable observations, and among them one by Charcot, where Broca himself made the dissection, and found the third frontal convolution sound. In this, as in other instances, the change was met with in the insula, which, on the other hand, is often not mentioned in *post mortem* reports as diseased.

A support for the correctness of the assumption, that the organ for speech, if such exists, is placed in the left hemisphere, lies in the fact, that the hemiplegia, which often occurs in aphasia, is almost always dextral. There are, however, authentic cases where the hemiplegia was left-sided. An attempt has been made to explain this by showing that, simultaneously with the lesion in the third frontal convolution, which produced the aphasia, another is found in the right hemisphere, giving rise to the sinistral hemiplegia. This explanation passes as satisfactory so long as in such cases no *post mortem* examination has been made, and its incorrectness proved. Ogle supposes that in these cases the aphasia depends on a change in the pons Varolii.

The physiological explanations given of the nature of aphasia also vary greatly. Gall considers that the loss of the faculty of speech

depends on a loss of the memory of words. Bouillaud joins him for one form of aphasia, while he makes his second form depend on abolition or diminution of activity in his "organe legislateur de la parole"—*i.e.*, on destruction, through lesion of this organ, of the combination of the muscular movements necessary for speech. It is this latter form which the question at present bears upon. No one denies that a defect in the memory produces a corresponding limitation of the power of expression; but this defect, of a purely intellectual nature, ought not to be designated by the name aphasia, for this might easily give rise to confusion capable of injuriously affecting the development of the question. One reason, however, for giving the name aphasia also to this loss of the faculty of speech is, that we, unfortunately, cannot always distinguish this form from the other; but of this more hereafter. Lordat and Dax, senior, entertain an opinion similar to that of Bouillaud, as they consider that aphasia depends upon defective co-operation of the muscles of articulation, though at least Lordat does not think of any distinct centre in the brain as regulating and co-ordinating their movements. Broca looks upon this opinion of Bouillaud as possibly correct, but believes rather that the aphasia depends on loss of a special memory assumed by him—viz., the memory of the combined movements which are in operation in speaking. Nevertheless, the existence of such a memory is at least doubtful. Of those who hold the unity of the brain, Trousseau considers aphasia in general as an intellectual disturbance, but admits the existence of cases where the intelligence is undisturbed: for these he adopts Broca's last-mentioned hypothesis. Baillarger refers the cause of the affection to a loss of the power of the will to determine to speech, a loss of "incitation verbale volontaire."

Among these different opinions, it would appear that Bouillaud's view—that aphasia depends on a disturbance of combination of the muscular movements, which is about the same as Lordat's ("asynergie verbale"), and which Broca looks upon as in the end correct—reckons the most adherents, though all of these do not accept the cause of this disturbance assumed by Bouillaud—lesion of his "organe co-ordinateur." If this opinion be correct, Broca will have aphasia looked upon as an "ataxie locomotrice," which view has obtained acceptance in England, where Sanders and Ogle designate this form of aphasia as aphasia atactica; that, on the other hand, where the memory has suffered, aphasia amnemonica. It is remarked, in opposition to Bouillaud, that the co-ordination of the movements of the muscles of speech cannot be said to be removed, as many aphasics can articulate one or more words very well. The objection may, however, here be made, that in ataxie locomotrice many degrees are met with, and that even in the graver forms certain muscular groups can co-operate and combined movements take place, though not always, when the patient wishes, and often only for a

moment. Broca's assumption, that aphasia depends upon a loss of memory of the movements of speech, is rejected by Baillarger, who believes that there is nothing to justify the assumption of this special memory. "Children endeavour to imitate and reproduce the sounds they hear spoken." "They try to exercise their muscles in combined movements rather than to acquire the memory of these movements." "The will can produce speech, but does not guide the several movements, which seem to be rather of a reflex nature."

As to the clinical signification to be attached to the name aphasia, writers have not been able to agree. Broca and Trousseau, the two principal authors, entertain, as has already been shown, far different views. Broca and his adherents will recognize as aphemia or aphasia only those cases where, with existing loss or limitation of the faculty of speech, no change is discoverable in the intelligence and motor apparatus. Trousseau indeed admits the exceptional existence of such cases, but will have aphasia, as a rule, looked upon as an intellectual disturbance, usually combined with other defects of the same nature, and often with other signs of cerebral lesion, as hemiplegia, contractions, eclampsia, &c. Both these views seem to me to be one-sided and unsatisfactory.

If we investigate a large number of cases we cannot avoid seeing the difficulty, nay, often the impossibility, of distinguishing cases of aphasia in a limited sense from those where actually a slight defect of intelligence—for example, a certain degree of dulness of memory—exists. When it is necessary to resort to the experiment of making the patient write, in order to study the degree of his intelligence, we need only remember how many, particularly old men of the lower classes, there are who are not able, or are only very imperfectly able, to write, and who easily forget what they could do in that way; and moreover, that the hemiplegia so often present frustrates the attempt; to see that this experiment is often made in vain. It must, therefore, no doubt, frequently happen that we cannot with certainty decide whether the case ought to be referred to pure aphasia or not. This will be still more true if we adopt Ogle's opinion, that the loss of the power of writing (agraphia) ought, as well as aphasia, to be distinguished into a. atactica and a. amnemonica.

If we adhere to the strict definition it may easily happen that we may in the same case at different times have an aphasia à la Trousseau and an aphemia à la Broca, nay, even an alalia à la Jaccoud. Suppose, for example, an apoplectic, who has regained intelligence but is still dull, has paralysis of the tongue and cannot speak, we have a case of alalia. After some time the tongue and the other muscles engaged in speech have entirely, or for the most part, regained the power of movement, but some dulness of memory, with inability to speak, continues; we have

now before us one of Trousseau's aphasics. The dulness gradually diminishes, the memory returns, but the speech is persistently imperfect. The case is now reduced to an aphasia in a limited sense—a Broca's aphemia. It seems incorrect to assert that aphasia exists only in the last case. It existed also in the second, though not alone, but combined with other symptoms of an originally more extensive cerebral lesion. In the first case we cannot, on the contrary, speak of an aphasia, for to it is necessary, on the one hand, sufficient intelligence to be able to think, and, on the other, sufficient mobility in the muscles of speech for the articulation of sound.

In my opinion we ought to be entitled to diagnose aphasia whenever the faculty of speech is more or less lost, and when this loss cannot be explained by dulness existing in the thinking power, or paralysis in the vocal muscles. We endeavour to recognize it, where it is met with, whether it be that the defective power of speech is the only symptom of a pathological change in the brain, or that it exists together with other symptoms of cerebral disease; in the latter case the same organic change may be the cause of the aphasia as in the former instance, although the lesion has also attacked other parts of the brain.

Aphasia is for us, however, only a symptom like certain neuralgias and paralyses of central origin, which, in one instance, at least for some time, may be the only sign of the central affection, in another, may be a link in a wider group of symptoms. This symptom deserves, however, when it stands alone, more than indeed to give a name to the disease, especially when we consider that the pathological process in the central organ may be of a different nature, as softening with or without a change in the vessels, hemorrhages from various causes, the pressure of tumours, encephalitis, &c., &c., and that the differential diagnosis may often be impossible.

With respect to Trousseau, it may be remarked that he endeavours to throw into the shade and to reason away the cases of aphasia, where loss of the thinking power stands entirely alone, although he must admit that such cases are met with. His view of both the physiological and clinical signification of aphasia he bases only on complicated cases, where, with loss of the faculty of speech, some intellectual defect or other is met with.

For the study of the physiology of the brain the pure cases of aphasia are incomparably the most important, but even the complicated cases are capable of affording information, as on *post mortem* examination we may find the same explanation of the symptom as in the simple cases. They teach us, moreover, to study this symptom in its relation to other symptoms of cerebral disease, and in general to investigate more accurately than hitherto the several symptoms.

I.— *Case of Epilepsy, with transient Aphasia after the attacks.*—Johansson,

a guard, was admitted into the Garrison Hospital in Stockholm, on the 16th December, 1863.

He had shortly before got a violent blow on the head, which deprived him of consciousness. In the journal from this time it is noted that he had a slight wound on the back part of the vertex, without any exposure of the bone or depression of the skull. He was quite confused, could not answer questions, nor even articulate any sound. No paralysis could be discovered, but the patient, on the contrary, moved with much violence, especially when his wound was dressed, whereupon he uttered a moaning cry of pain. Ice to the head. Enema aperiens. On the 18th he began to endeavour to answer, but his speech was still extremely confused and unintelligible. On the 20th he could enunciate short sentences clearly but slowly; in general he still lay in a lethargic condition. Blister to the nape of the neck. In the beginning of January it was observed that he had lost the power of reading. If a book were placed in his hand he could distinctly read a few words, but he then began to skip over some, and to introduce others quite foreign to the purpose, so that the whole was entirely unintelligible. His speech was at the same time imperfect, when he had to utter long sentences. These defects were gradually removed. Before the 28th February it was found that he was quite coherent, but rather sensitive and childish in his mind. On the 29th January he had an epileptiform attack, which was repeated a couple of times during the spring. Later in the season he was dismissed. During the first part of his stay in the hospital he was under the care of Dr. Edholm, subsequently of Dr. Lundberger.

After his return home he was for a short time free from attacks, but they soon came on again, and became gradually more frequent. His spirits were bad. In the beginning of 1865 he gave up the service. On the 9th of April he was re-admitted into hospital, having had ten or twelve fits during the preceding twenty-four hours. On his admission he was ordered a bladder of ice to the head and a turpentine enema. On the 10th the note of his case was—"Seven epileptiform fits since yesterday afternoon; a small cicatrix on the posterior part of the vertex, at the right of, and close to the mesial line." The patient lies in an apathetic and stupid state. He answers slowly "Yes" and "No," but on attempting to utter a long sentence, what he says is, with the exception of a word or two, quite unintelligible. On asking him if he feels any pain, he points to the left part of the forehead. The pupils are normal and movable. The pulse is about 100, of moderate fulness and strength. No fever. Bowels moved after the enema. Urine passed in the bed. Nothing else remarkable. Glauber's salt in cooling doses. On the 12th blister to the nape of the neck. His state continued the same until the 18th. He had four or five fits in the twenty-four hours, was in general dull and apathetic, but sometimes violent. In his rational moments he

complained of pain in the left side of the forehead. His speech continued scarcely intelligible, yet usually more so than on his admission. On the 18th the attacks began to occur only at night. He was now more wakeful, and spoke better, although thickly. On the 28th he had been for nine days free from attacks; was quite rational; spoke in general distinctly, though slowly—sometimes skipped over a word or uttered it indistinctly. During the night before the 29th he had at least 20 fits; in the morning was quite dull and stupid, and did not answer. In the afternoon of the 30th he began to regain consciousness. The power of speech was now at first completely removed, but gradually returned. His state continued in this manner alternately improving and getting worse, the power of speech on each occasion, when numerous attacks occurred in a short time, being completely lost, but gradually returning. The blister to the nape of the neck was repeated. The bowels were kept moderately open by means of Glauber's salt. For some time iodide of potassium was employed, though without effect. On the 28th of May I noted—"During the night numerous slight attacks occurred three or four times in the hour, characterized merely by twitchings in the head, distortion of the face, and fixing of the eyes. They lasted only a minute or two. The patient endeavoured to speak immediately after they were over. He himself says he retained consciousness during the attack. To-day at the morning visit he seemed lively and wakeful. He can only imperfectly articulate sounds. At one time a word passes his lips, at another he cannot, notwithstanding all efforts, utter the same word. A word or two he can often utter distinctly, but when he continues to speak he becomes entirely unintelligible. He is conscious of his incapacity. After he has in vain endeavoured to express his thoughts orally he shakes his head discontentedly and sadly, and endeavours to say "I cannot speak," in which he sometimes succeeds, although stammeringly and with difficulty. Sometimes he can utter only the first word. When asked if he means this or that, he makes an affirmative or a negative sign with his head. Objects shown to him he endeavours, though usually in vain, to name, and he knows their use well. He understands what he reads, and endeavours some time afterwards, when requested, to utter the words he has read. During all this he never employs words incorrectly. His writing is as bad as his speaking. He attempts to form letters, but soon throws away the pen. He can with ease protrude his tongue straight forward, but its pointing and other movements are rather slow and uncertain. There is no other trace of paralysis.

The attacks continued all day; in the afternoon the patient was particularly dull; the power of speech was entirely lost. The right arm was semiflexed, the right leg was extended; both were motionless, and maintained the position given to them. The left extremities moved easily. Even the following day the paresis had passed away. On the 30th, as

the attacks continued and were numerous, six leeches were ordered to the left temporal region.

31st.—Only one fit yesterday; several during the night. June 5th.—No attack for five days. The patient is quite coherent. The power of speech is restored, except that there is a slight hesitation. 9th.—One or two slight attacks during the last twenty-four hours. 10th.—Incessant attacks during the night, of various strength, though they were generally slight; these still continue to-day, and recur once in about every five minutes. His speech is extremely indistinct. Most words he cannot utter, though his gestures and bearing clearly indicate that he knows what he wishes to say. What he means is often plain from one or two syllables in conjunction with a gesture. Six leeches to the left temple, the bleeding to be encouraged as much as possible. Same day in the afternoon: Constant numerous slight attacks. Power of speech quite lost. All attempts fail. When he attempts to speak, movements of mastication and deglutition come on instead. The tongue can be protruded and moved quite easily and powerfully from side to side.

The attacks continued during the following days, and the patient became duller and duller. On the 12th the evacuations were involuntary. On the same day it was observed that the right naso-labial fold was obliterated, and that the right angle of the mouth was rather pendulous, but the tongue was movable. On the afternoon of the 15th six cupping glasses with scarification were ordered to the nape of the neck. From this time he had in general only one attack in the hour until four o'clock the following morning, after which the fits entirely ceased, not to return, so long as the patient remained in the hospital—more than six months.

The faculty of speech again improved quickly, and in the course of a fortnight was quite restored. The pronunciation of the consonants h, k, s, and x, was the last to be regained. Even afterwards a slight hesitation was sometimes observed. The patient's long delay in the hospital was caused by the fact, that during convalescence after the convulsive attacks atrophy invaded the muscles of the left forearm and hand, preceded and accompanied by violent neuralgia in these parts. The patient also occasionally complained of pain in the forehead.

He was dismissed on the 31st December, 1865, but came into hospital again on the 16th of February, 1866, in a state of unconsciousness. He had the same day had several violent epileptic attacks after taking some glasses of brandy. They were not repeated in the hospital, and he soon recovered. He was dismissed on the 9th of March. Later in the year he got his discharge and disappeared from Stockholm.

This case presents the not unusual example of aphasia occurring during epilepsy. It is less common to see aphasia come and go so often in a comparatively short time. On every occasion that several attacks

occurred soon after one another, the power of speech suffered in a greater or less degree, and was gradually completely lost. When the attacks ceased or became less frequent, the power of expression soon returned. At the same time both intellectual disturbances, and occasionally also paralytic phenomena, set in and disappeared, but the aphasia always preceded them, and was the last to cease. Usually there was a diminished power of moving the tongue, but this certainly depended much on the contemporaneous dulness, and was moreover quite incapable of explaining the defect in the faculty of speech. We often found, especially during a temporary improvement, the movements of the tongue fully defined, while the power of speech had as yet scarcely begun to return. The tongue when protruded always deviated to one side. The other paralytic symptoms—at one time paresis of the right extremities, at another of the face—were dextral. In the attempts I made to get him to write he failed, but I unfortunately forgot to investigate his capability in the art of writing, after he had got better; probably it was even then inconsiderable. He was constantly, and even after the attack ceased, rather sensitive and easily excited, but his loss of the power of speech could not, of course, excepting at the period of the height of the exacerbation, be placed to the account of any intellectual defect. He knew very well what he wished to say, and made great efforts to bring out the words. When he failed he appeared unhappy and perplexed.

As to the etiology and more accurate diagnosis of the case, it is probable that originally the blow on the right side of the vertex produced, by *contre-coup*, a contusion with laceration of some point in the left frontal lobe. During the obliteration of this change, probably by cicatrization and atrophy of the part of the brain, the epilepsy set in. Besides the place which the blow struck, the obstinate pain in the left part of the forehead would show, that the mischief was located in the left frontal lobe; in favour of the left side were the dextral paralytic symptoms. Now, as since the first appearance of Broca's statement, not a single case has been brought forward, where a lesion of the posterior part of the third frontal convolution has occurred without a corresponding and persistent loss of the faculty of speech, and in our case the aphasia was only temporary, came and went, we may rest satisfied that Broca's region was not, in this instance, directly injured. It is possible, on the other hand, that the change was to be found somewhere in the neighbourhood, and that during the repeated epileptic attacks the disturbance of the cerebral circulation affected, in the first place, the immediate surrounding of the previously altered part.

In a therapeutical point of view, the great effect which cupping the nape of the neck had upon the attacks deserves to be noted. After having lasted for many months, and having latterly been often so numerous, that the one attack followed directly on the other, they

entirely ceased immediately after the cupping. The minor abstractions of blood from the left temple I prescribed on the supposition that cerebral lesion existed beneath the part.

2.—*Case of Miliary Tuberculosis; Tubercles in the Brain; Aphasia with Hemorrhage in the Island of Reil.*—Carlsson, aged twenty-one, admitted into the garrison hospital on the 19th September, 1865.

The patient had sickened a week previously with general indisposition, want of appetite, some thirst, disturbed sleep, to which, after a few days, supervened headache. The bowels were torpid during the whole time, with the exception of a couple of days, when aperient medicine was taken. *Status præsens* Sept. 20.—The patient is pale and languid, complains of the above symptoms, which, nevertheless, he believes to be slighter to-day than they were yesterday. The temperature of the skin is little, if at all, elevated. Pulse 72, rather weak. The tongue almost clean; to-day some little appetite. Abdomen sluggish; no motion during the last two days. Spleen not enlarged. The urine contains a small quantity of albumen. Nothing else noteworthy. Phosphoric acid.

Sept 25th.—The above slight symptoms have constantly increased. The patient has generally lain silent and reserved, but when asked how he is he says he is rather better than before. Yesterday evening he began to speak indistinctly, without anything unusual having been previously remarked, and without his state having otherwise indicated the slightest confusion of mind. This continues to-day. He is wakeful and apparently clear in his mind, but silent. His countenance is pale. Pulse 58. Temperature in the axilla, 100°·04 F. When questioned he endeavours to answer with suitable words, but his speech is particularly indistinct, especially certain consonants—k, s, h. Usually he can utter, so as to be tolerably well understood, the first word, or a couple of words, of a sentence, but the rest becomes merely a mumble, impossible to understand. The tongue, rather dry and furred, he protrudes when desired, and moves it with ease in all directions. The two sides of his face are quite symmetrical. The pupils are normal, and quite movable. He shows that he suffers from pain in the forehead and weakness.

26th.—During the course of yesterday he became more drowsy and apathetic. The power of speech diminished more and more, and from the afternoon he ceased to answer. He usually lay upon his back, but sometimes he bent himself up, sometimes stretched himself out in his entire length. Yesterday afternoon he got an aperient enema, which produced a loose motion. To-day he lies in a semi-comatose condition, from which he cannot be completely roused. It is only after several vain efforts that he can be got to stammer out a yes or a no to a question. His appearance is dull; his mouth and his eyes half open; his eyes

at one time quiescent, at another they move slowly from side to side. His tongue is dry. No vomiting. Abdomen hard, moderately swollen. Over the postero-inferior parts of both lungs numerous finely vesicular loose râles are heard. The spleen is not enlarged. The urine is free from albumen. Blister to the nape of the neck.

30th.—The patient's state has continued about the same. No lesions of motility. Speech very imperfect, but he now generally tries to answer. When he is not understood he becomes annoyed and turns away. No vomiting. No motion since the 27th, when he got Glauber's salt, which he afterwards took in doses of a teaspoonful twice a day.

Oct. 2nd.—Increased stupor. Now and then he makes an attempt to answer questions, but succeeds only very imperfectly. Passes urine involuntarily.

3rd.—In the course of yesterday the temperature began to be somewhat higher. The face, previously pale, occasionally flushed. The pulse was increased in frequency. To-day he seems rather more wakeful than before; shakes his head when asked if he slept during the night. When desired he slowly protrudes his tongue; its tip is directed somewhat to the right, but it can, however, with tolerable ease, be brought into another direction. His face is slightly flushed. The conjunctivæ are rather injected. The right pupil is considerably larger than the left, and is not perfectly round; both are slightly, though somewhat movable. After an enema yesterday he had a slight motion; a second followed involuntarily in the night. Yesterday evening a bladder of ice was ordered to the head, which is still continued.

5th.—The patient's state during the last two days is as before. The pupils are as large, tolerably wide, little movable; the right continues to be not entirely round. The right upper eyelid hangs lower than the left, but can be completely raised. When the patient is left to himself, a slight strabismus divergens sometimes comes on. The respiration is so far altered that a number of slow inspirations are followed by a number of more rapid ones. The gum has a tendency to bleed. The tongue is dry. The abdomen is more sunk in.

The patient died the same day at half-past 8 p.m. Temperature and pulse since the 25th :—

	Morning.	Pulse.	Afternoon.	Pulse.
Sept. 25	100°·04 F.	58	101°·56	60
26	101°·84	50	100°·04	54
27	98°·96	52	99°·68	54
28	99°·32	48	102°·92	52
29	99°·68	52	99°·68	50
30	101°·48	58	102°·2	56
Oct. 1	100°·4	60	101°·56	62
2	98°·6	90	101°·84	120

		Morning.	Pulse.	Afternoon.	Pulse.
Oct.	3	101°·12	84	102°·56	120
	4	101°·84	125	102°·2	120
	5	100°·4	120	100°·04	160

Post mortem examination on the 7th October, thirty-eight hours after death:—

Considerable emaciation. General rigidity. Skull of the usual shape. Dura mater congested. On the inside of its left half are found a large number of partly distinct, partly agglomerated, shining, transparent, grey granulations, raised above the surface, as large as the heads of pins. Most of these are situated in the middle of the lateral portion of the left hemisphere; the others are grouped around this point. On the right half of the membrane only two such granulations are met with; they are located in small depressions in the cortical substance of the brain. Corresponding to the part of the left half of the dura, where the granulations are most dense, a number of similar tubercles are found in the soft membranes, which follow chiefly the course of the vessels, and are here and there conglomerated into large irregular masses. Beyond this surface only a few granulations are met with over the convex portion of the left hemisphere. Around the chiasma, and as far as the pons, the soft membranes are infiltrated with a yellowish green turbid fluid. The surfaces of both optic nerves exhibit a tolerably intense redness, the right oculo-motor nerve a general rose colour both on its surface and—although in a somewhat less degree—in its interior; the left abducent nerve is for the length of an inch dark red on the surface. Scattered miliary tubercles are found in the soft membranes on the under surface of the frontal lobes. In the commencement of the right fossa of Sylvius they are met with, though only in small number. In the left fossa, on the contrary, the membranes are sprinkled and thickened with numerous granulations. In the upper part of the fossa of Sylvius a coagulum of blood larger than a nut is found. Corresponding to this part the cortical substance on the posterior portion of the island of Reil, with its immediately surrounding, is softened and discoloured, with a number of point-like hemorrhages. The soft membranes of the brain are in general rather congested. They are easily separated from the surface of the organ. When they are removed a not inconsiderable number of tubercles, of the size of hempseed or less, appear proceeding from the intergyral portion of the pia lodged in small depressions in the cerebral substance. Similar tubercles, even somewhat larger, are found scattered, to the number of from twelve to fifteen, in the cortical substance, mostly in the convex part of the left hemisphere. The majority are situated in the innermost part of the cortical substance, or on the boundary between this and the white substance, but a couple are met with on the outer surface, some within the white substance but quite close to the grey.

Both lateral ventricles are rather dilated; their contents are almost clear, and are of a light red colour. The surrounding parts are in general loose and pale. The white substance is otherwise pale, but, as well as the grey, is of ordinary consistence; the grey is rather congested. The central cerebral ganglia are free from any remarkable change.

On the upper surface of the cerebellum are seen three cheesy, yellowish tumours, as large as peas, of brittle consistence, occupying the grey substance in its entire thickness, and passing into the white. The medulla oblongata exhibits a considerable injection in the corpora restiformia.

The more accurate description of the other organs I shall here omit. Numerous miliary tubercles were found in the lungs, liver, spleen, and kidneys, some few in the serous investment of the heart and on the peritoneum. In the liver a number of cavities, varying in size from that of a hempseed to that of a pea, were met with, filled with a thick yellow fluid, and surrounded by a more or less thick membranous boundary. The solitary glands in the large intestine, as well as, though to a less degree, in the lower part of the small intestine, were considerably swollen, and were here and there ulcerated; in the large intestine were some ulcers as large as Swedish farthings (öre). In their fundus no tubercles were met with.

It is possible that some, on reading the above case, may be inclined to question its title to be brought forward as an example of aphasia. It is, however, to be borne in mind, that during the first twenty-four hours, when the power of speech was affected, the patient's inability to express himself was the only prominent symptom, while no paralysis was met with in the tongue, and there was evidently sufficient intelligence to form ideas and to wish to express them; we are, therefore, I think, quite justified in singling out the defect in the faculty of speech, and of speaking of the case, during the above-mentioned time, as aphasia. During the further development of the case, also, we occasionally found the power of speech altered to a higher degree than was proportionate to the intellectual decay. The patient endeavoured to form words, and from a syllable or two we could perceive that the word was clear to himself, that speech took place within him, while the articulation of the sound, the outer speech, was extremely limited. On *post mortem* examination I first sought the cause in the third frontal convolution, but found it instead in the posterior part of the island of Reil and its immediate neighbourhood (the very bottom of the fissure of Sylvius), that is, in about the place which Dax, junior, and Sanders consider to be most closely connected with the faculty of speech.

3.—*Case of Dextral Hemiplegia and Aphasia.*—This case has been communicated to me by Dr. v. Sydow, of Gefle, who has already, on several occasions, made valuable contributions to the Journal.

Dr. S. was called on the 23rd July, 1866, to the widow of a seaman, aged sixty-two, who the day before, while out walking, on stooping down to tie one of her shoes, suddenly lost the power of speech, became distorted in the face, and began to drag the right leg, so that she was obliged to be supported home. Dr. S. found the right extremities paretic, the mouth drawn obliquely to the left. Her speech was thick, her answers incoherent. Even on the 25th of the same month the distortion of the face was much diminished and the power of movement in the right arm increased, but the patient seemed not to understand rightly what was said to her. In consequence of pressure of business during the then prevailing epidemic of cholera, Dr. S. did not see her until the 27th August, when he observed that her speech was limited to unconnected syllables, mixed with single short words without meaning. On the 25th September the power of motion was considerably increased in the extremities, the obliquity of the face had disappeared, but the tongue still deviated, when protruded, somewhat to the right. Her speech was also very imperfect. By gestures and her general manner, however, she showed unequivocally that she understood what those about her said to her, and she could, in ordinary cases, make herself understood. She listened with an attentive aspect when she was spoken to, and endeavoured to answer, but her answer was only a word or two or a short sentence, which she pronounced clearly and plainly, often repeatedly, after which she ended with the well-modulated enunciation of certain syllables. Her efforts, at the same time, resembled not the endeavour of a stammerer to get the vocal organ to express a definite word, but rather the delight of a child in speaking long series of unconnected syllables and composing words of them, which signify nothing. She had never been able to write. That she to the last retained at least a certain degree of mental powers is shown by the fact, that she then had the Bible read to her, and that before her death she received the sacrament of the Lord's Supper.

On her cerebral affection an extensive bronchial catarrh supervened towards the end of September. She died on one of the last days of the same month.

Dr. S. had not found any affection of the heart.

The brain was sent to me for examination. The preparation had suffered some injury from the long journey, but the following could, without difficulty, be established:—While the upper parts of the brain have their normal arching, the posterior part of the third left frontal convolution, the inferior part of the ascending frontal convolution, and the anterior part of the superior temporal convolution, are collapsed, loose, and easily shaken. The same is the case with the whole of the fissure of Sylvius met with between these two points, including the entire of the island of Reil. The soft membranes can with care be

separated from these parts. The outer portion of the cortical substance has a certain consistence, can be cut, has a yellowish colour, while the inner part, as well as the adjoining white substance, is often softened to the depth of half an inch into an unctuous mass, presenting a white ground colour studded with red points and streaks. Nowhere are there traces of any hemorrhage. The vessels in the left fissure of Sylvius are everywhere permeable. In some places at the divisions a slight thickening is seen, as in some of the other larger vessels at the base of the brain, but the inner surface of the vessel is even and smooth, without any deposition. The other parts of the brain exhibited no remarkable change.

In the outer part of the cortical substance, on the altered part, a large number of fat corpuscles were met with; also small one-nucleated cellular bodies, with or without fatty degeneration of their contents; in the walls of the vessels were often fat globules in variable quantity; in the foci of softening were also found free fat, detritus, and myelin.

The cause of the symptoms in this case is, therefore, found in a considerable change in the left cerebral hemisphere. This occupied both Broca's region and the island of Reil, and the adjoining parts throughout no inconsiderable extent. In the cases of aphasia which have been submitted to dissection, more or less extensive softening has often been found, with or without emboli, in the afferent vessels; more rarely hemorrhages or other changes. Not unfrequently a cardiac lesion has proved to be the cause of the embolism.

It is not easy to decide how the above case commenced. The paralytic attack points to embolism or hemorrhage; but, according to Dr. v. S., no cardiac lesion was met with, and on dissection the vessels were found permeable, without deposition or any remains of hemorrhage. It is possible that in the commencement a capillary hemorrhage occurred in a limited point, and that subsequently softening took place in the surrounding part.

Nor in this instance is the question of simple aphasia, but both a disturbance of intelligence in the form of general dulness, and diminished mobility of the tongue were observed, but neither was, as appears from the history of the case, so important as to be capable of explaining the greatly-diminished power of articulating sounds in speech.

Teale's Amputation—Proposed Modification.

27, Upper Merrion-street, Dublin,
26*th October*, 1868.

TO THE EDITOR, DUBLIN QUARTERLY JOURNAL OF MED. SCIENCE.

Sir,—It has long since occurred to me that a modification of the above operation might with great propriety be proposed, if not adopted. The distinguished surgeon after whom it is named was himself aware of the sacrifice of bone which it involved. To remedy this defect is a subject well worthy of the careful study and best endeavours of surgeons. With this view I am anxious to submit to their notice, and invite their co-operation in, the following experiment on the dead subject, for the purpose of testing the practicability of the proposed plan:—Let the measurements for Teale's amputation be accurately taken and mapped out, but instead of dividing the bone—I am now specially referring to the thigh, at the site directed by him—let it be sawn at the situation corresponding to the inferior termination of *his* posterior flap, and let the superior boundary of the anterior flap be limited by the same plane. The saving of bone thus effected will be considerable, and therefore tend directly to diminish the mortality of thigh amputations. According to this method the anterior flap will be shorter by a fourth than Teale's, and there will be no posterior flap. I and other surgeons have tried this modification, and apparently with all the success that could be wished for. It would be very desirable, however, that it should be thoroughly tested before its adoption in practice, and hence I am desirous of directing the attention of your surgical readers to the subject.

I am, Sir, your obedient servant,

J. H. Wharton.

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